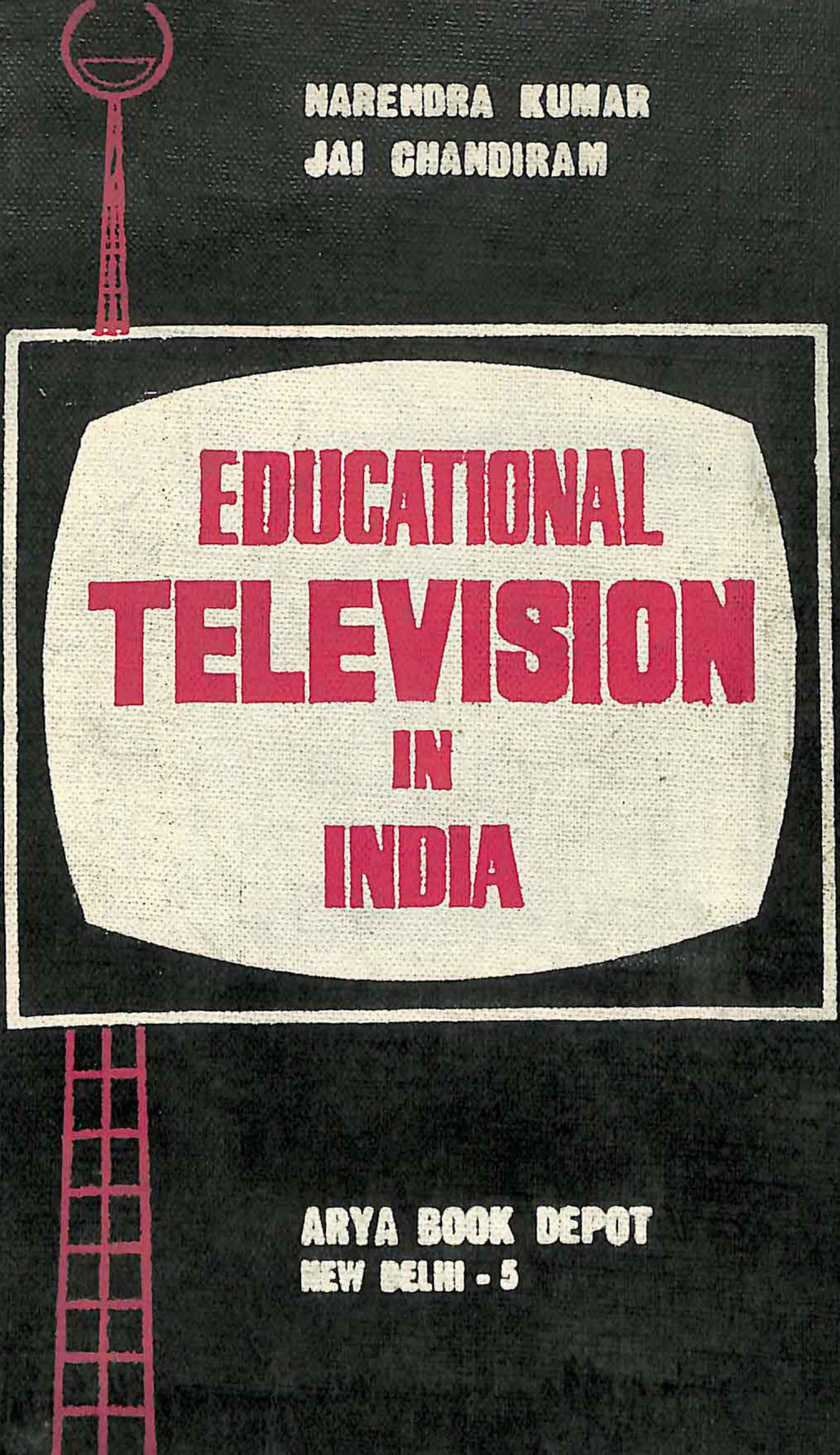

NARENDRA KUMAR
JAI CHANDIRAM

# EDUCATIONAL TELEVISION IN INDIA

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# EDUCATIONAL TELEVISION IN INDIA

**NARENDRA KUMAR**
M.A. (London)

**JAI CHANDIRAM**
M.A. (Florida)

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# FOREWORD

The Delhi School Television Project was conceived as an innovation in education, and one which would demonstrate the usefulness of mobilizing and applying technology in meeting urgent national needs and national purposes. Amidst India's many faiths, many languages, and dialects there is evidence of an abiding cultural unity. The 1950 Constitution provided further unification in its aim to secure "justice, social, economical and political; liberty of thought, expression, belief, faith and worship ; equality of status and of opportunity ; to promote among them all fraternity assuring the dignity of the individual and the unity of the nation."

The role of education is central in the achievement of such a democratic social order. Television uses as conceived in the Delhi Project was to do more than supplement the work of the classroom. The telecasts were geared to the critical needs of the school—the training and up-grading of teachers, and assisting in the solution of problems caused by limited facilities and space, programs were related to the sequential curriculum experiences which constitute the educational program. The intimate relationship to the school curriculum, the consultation between producers and teachers, ongoing evaluation of program effectiveness and program utilization, the collective enterprise of the Ministries concerned, the Delhi State education authorities, the personnel of All India Radio, were all significant elements in the design and implementation of the school television project.

The success of the use of television in the Delhi schools stands as testimony to the endeavour, zeal, and professional competence of a host of persons : among them, the classroom teachers who had to understand and accept new roles and relationships in the process of using television in the classroom ; school administrators who had to undertake and accommodate changes, such as those necessitated by TV scheduling, by planning and organizational meetings ; and the television teacher who gave hours and hours to planning, and hours in the studio under production pressures and who submitted bravely to being a performer before a host of his colleagues and who was the principal target of comment in critic and evaluation sessions.

This publication would be of immense interest and utility to all those involved in organisation, planning, production and utilization of Educational Television.

*Gainsville*
*26th December, 1966*

KENNETH CHRISTIANSEN
*Ford Foundation Consultant*
*Director of Television,*
*University of Florida,*
*Gainsville, U.S.A.*

# PREFACE

The primary purpose of the Delhi School Television Project is to put out regular, systematic, in-scoool instructional programmes. Television does not offer total instruction in a given subject. Under the scheme, the TV and classroom teachers form a team of equal partners using their skills to complete prescribed course of studies. The TV teacher imparts basic knowledge on selected topics. The classroom teacher develops the basic concepts, clarifies them, clears up misunderstandings, evaluates pupils' progress and takes the class ahead. The aim is to enable the classroom teacher teach better and quicker. The success of such a scheme chiefly depends upon the quality of TV lessons and understanding and co-operation between the classroom teachers and TV instructors. As is known, teachers are not easily convinced of the educational value of the mass media. The classroom use of these new innovations is still regarded as yet another wearisome and wasteful extra-curricular activity. Convincing the classroom teacher has been one of the major jobs for the School TV organisers in Delhi. A close look at the appendices, specially V and VI would reveal to what extent the classroom teachers participate in planning and evaluating school TV lessons ; and how far they have gradually started influencing even the presentation techniques.

It has been possible for us to give detailed information regarding evaluation methods and results, because of easy access to the records of All India Radio, being the members of the staff. We wish to thank the organisation for this.

We are extremely grateful to Dr. Kenneth Christiansen, the Ford Foundation Consultant for his foreword.

We hope that this publication will stimulate purposeful discussion among all those concerned with education in general, and with the organisation, planning, production and utilization of educational television in particular.

*9th February, 1967*

Narendra Kumar
Jai Chandiram

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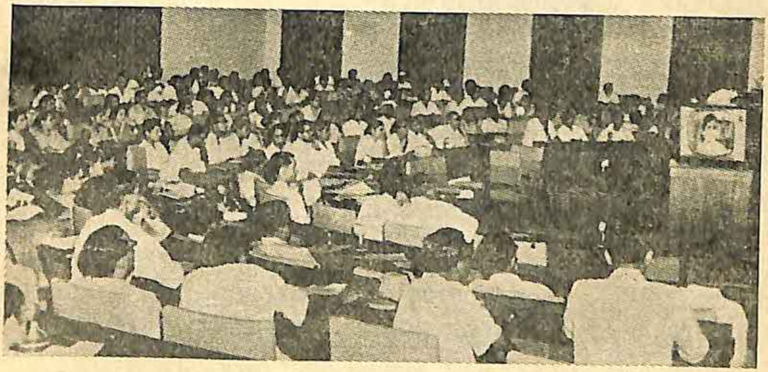
# Delhi School TV Project

Today more than 1,50,000 students in nearly three hundred Delhi Higher Secondary Schools regularly view television lessons closely related with their prescribed course of studies in General Science, English, Social Studies, Physics and Chemistry. The project was launched in 1961 by All India Radio in close collaboration with the Delhi Directorate of Education and with the financial assistance of the Ford Foundation.

Last year an Australian Observer on an Educational Television Evaluation assignment from UNESCO reported thus:

"The outstanding elements in the Delhi Scheme are *sound planning*, carefully *planned cooperation* at all levels and thorough integration with the *syllabus* of work in the schools; the teachers have been *fully involved* at all stages from planning to evaluation."[1]



During 1964-65 more than a thousand teachers and principals were involved in a total of 34 planning and evaluation group meetings.

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[1] 'Educational Television in Developing Countries; Report published jointly by Australian Broadcasting Commission and Japan Broadcasting Corporation, p. 33.

In 1965 and also in 1966, All India Radio's Television Lessons in the series 'English Through the Structural Approach' received prizes in the international educational programme contests organised by the National Broadcasting Corporation, Japan. India's other entry, a Physics Lesson was also included in the International Anthology of exemplary instructional programmes.

## The Impact of TV

How the TV lessons create initiative and inquisitiveness in the viewing students is narrated in these observations of a class-teacher : "For verifying laws of reflection and refraction Hartley's optical disc is shown to the class, and no experiment is preformed due to paucity of time and non-availability of sun's rays at the demonstration table. The demonstration of the experiment on TV excited the students. Forgoing their lunch break, they made an effort to prove the law of refraction. They arranged an apparatus to get the sun rays through slits, and passed the rays through a prism. On another occasion, they wanted to float a magnetic needle along the magnetic lines of force, using a bar magnet placed in a trough of water. They secured a trough from the Chemistry laboratory, magnetised a piece of knitting needle, and ultimately after long efforts observed that an isolated pole moves along the lines of force.

After viewing TV lesson on "Frictional Electricity", the students did not forget the experiment seen on TV to rub a balloon and charge it with electricity, then fix it to the wall. Next day a few students brought balloons and repeated the interesting phenomenon".

Thus TV lessons open a lot of avenues in the students for new creative activities by encouraging model making, experimenting with home made apparatus and becoming keen observers.

A school principal writes, "the impact of teaching through television on school studies has been on the whole very wholesome. The scepticism felt in the earlier stages has given place to confidence. ...Rigidity and uniformity of TV pragrammes have also helped in activising the classroom teacher. ...It has also to some extent solved the problem of the school with limited science material at hand."

Dr. Kenneth Christiansen, Ford Foundation Consultant, who shared an intense and continuing interest in the project, after detailed discussions with school principals, teachers and students, in one of his evaluation notes recorded his impressions thus:

(1) House examinations have demonstrated improved performance by television lessons.

(2) Enthusiasm for science has increased.

(3) Students report that science concepts are made more interesting, more meaningful and much clearer.

(4) Teachers report that the tele-lessons put greater demands upon their time, because the preparation they must make is more intense. Obviously, this is a positive factor. The Principals commenting on this point observed that this 'pressure' for better preparation results in better classroom teaching.

(5) Teachers and Principals feel that the intense listening and attention demanded of students in viewing and following the TV lesson is an excellent discipline that improves learning and intensifies the learning experience.

(6) The English lessons are effecting a consciousness both of pronunciation and usage. Students frequently correct English pronunciation of fellow students.[1]

Five years is not too long a time for teachers to accept whole heartedly any new teaching innovation. Yet the results achieved so far are quite encouraging. Here are a few observations from the Evaluation Report of Dr. Paul Naureth, Professor of Sociology and Statistics in the University of New York, who conducted a scientific evaluation in 1965:

(1) "The television project is indeed an operation of impressive magnitude that has expanded over the last five years and is still expanding steadily both in numbers of schools and students participating, in subjects covered and in number of lessons being produced and telecast each week. To have undertaken it at all showed a

---

[1] "Evaluation Note submitted by Dr. Christiansen to the Ministry of Information and Broadcasting on January 5, 1962.

pioneering spirit, to have overcome a good deal of the natural resistance of teachers to a major teaching innovation showed leadership in pedagogical matters.

(2) Television is already proving itself as a useful aid to teaching. That judgment that television is indeed a valuable aid to teaching rests not only on our own observation, it rests also on the comments of dozens of teachers and principals, who in spite of numerous criticisms they had to offer joined in an almost unanimous chorus that television basically is a useful addition to the teaching of science, that they would not want to miss it.

(3) Students are learning more or better with television than without television. They see more and better experiments and they see them in more detail than their own class-room teachers can provide in most schools in Delhi with present laboratory space and equipment; some of the experiments shown on television even the best schools could not provide. In addition they see a host of other things that serve to widen the horizons of children who would otherwise never have an opportunity to see these things or even learn of their existence. But, and this is important, even many of the most ordinary experiments and demonstrations produced in the classroom cannot, because of crowded conditions be seen, many of these do now become understandable to the student who sees them in great detail on television.

(4) There is slight overall superiority, of the results of the students in TV schools, over those of students in non-TV schools. ...It is my distinct impression that with the improvement of teaching by television, that can no doubt be expected with more experience and more systematic staff training, this slight superiority of results from TV schools is going to increase.

(5) The whole teaching process, though not necessary, the teaching performance of every single teacher, is slowly undergoing a change for the better. Teachers are giving more thought to what topics need to be included in the syllabus, also what from a pedagogical point of

view is the best sequence, both within a year and between years.

(6) Many of the principals are taking a new interest in the teaching of science in their schools.

(7) Among students there is an increased interest in science as a subject. Also, beyond that there is a social impact: television makes a contribution towards equalizing educational opportunities.

(8) A change of attitudes and actions taken is percolating through the whole school system, in both directions, upwards from the teachers and backwards from the Directorate of Education."[1]

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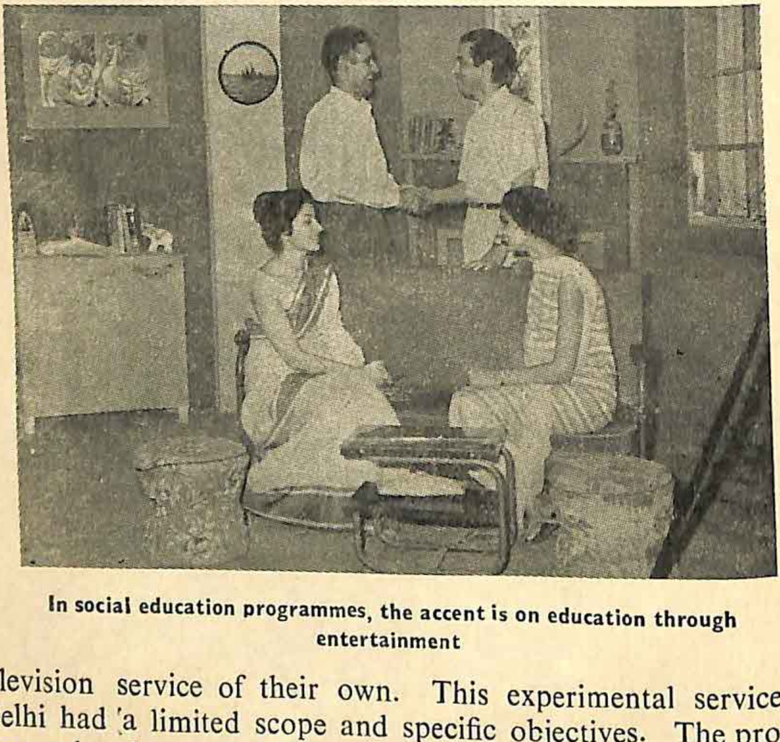
[1] Dr. Paul Naureth, The Delhi School Television Project 1965 (Mimeographed).

# First Steps

A significant stage in telecommunication in India was reached on the 15th September 1959, when All India Radio's Experimental Television Service was inaugurated. On this day India joined the small community of Asian nations with a television service of their own. This experimental service in Delhi had a limited scope and specific objectives. The project was undertaken mainly for experimentation, training and evaluation; experimentation mainly in two directions : for putting out programmes primarily of educational and cultural value to



**In social education programmes, the accent is on education through entertainment**

communities—both urban and rural; and also some programmes of interest to schools; and for carrying out technical investigations on propagation transmitter and studio techniques.

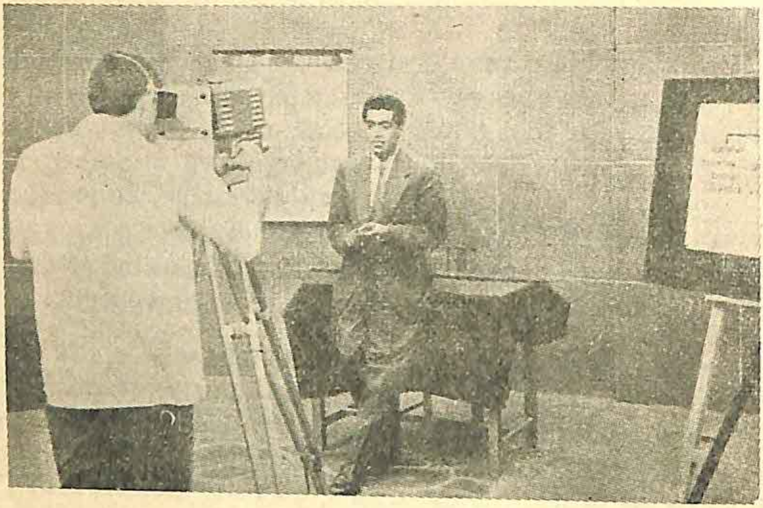
The programmes were designed primarily for community viewing. The main objective was to impart social education. In collaboration with the Adult Education Institutions sixty-six Community Centres (Tele-Clubs) were organised in and around Delhi. The Tele-Club Organisers, usually persons running social education centres, were given a short training in organising informal follow up discussions, and in reporting back the reactions of the group to AIR's TV Centre (For details see Appendix 1).

After AIR started the general programme service, and while it was planning the first school series, the Representative of the Ford Foundation in India was approached to assist the development of Educational Television. To survey the existing state and potential future of ETV in India, a Ford Foundation team of TV experts visited India from January 24 to February 20, 1960. The team was made up of Dr. Lester W. Nelson, Associate Programme Director, as Chairman, and Mr. James W. Armsey, Associate Programme Director of the Ford Foundation; Dr. William Brish, Superintendent of Schools, Washington County (Hagerstown), and Dr. Kenneth Christiansen, Director of Television, University of Florida (Gainsville), as members. These persons were selected because of their varied background and experience in the development of educational television in the United States.

In the meantime, on 19th January, All India Radio in co-operation with the Delhi Directorate of Education started a weekly series of specially designed programmes for the benefit of the IX grade students of the Higher Secondary schools. Viewing was organised under the guidance of a 'Teacher-Sponsor' in some of the Tele-Clubs. These were composite programmes of one hour duration. The aim was to present enrichment programmes, and also series having a bearing on the prescribed school syllabus.

Some of the subjects covered were: science in everyday life, evolution of life, the life of Ashoka, health and hygiene, good Hindi, and our neighbours. Besides these, some humorous skits, puppet shows, and plays enacted by students were attempted.

At the end of the programme, the teachers conducted follow up activities and reported back to the TV centre.



**The Beginning**
**First school TV lesson in progress.**

AIR's main objectives in undertaking this experimental effort was to gain experience in the use of television for school-related purposes, to acquaint the staff with planning and production problems, and to get an assessment of the effectiveness of television as an educational medium from school principals, teachers, students and education authorities.

The Ford Foundation team and the TV producers viewed some of these programmes along with the principals and teachers. They also visited a number of schools to have a close look at the quality of instruction, equipment available, physical facilities. They also had a number of discussions with the education authorities.

As a result of the recommendations of this team, Ford Foundation agreed to give a grant of 564,000 dollars to the Government of India to provide partial support over a period of four years for a programme of educational television for the Delhi school system.

Regarding the use of this grant, the team recommended that the budget could be utilised for the following purposes :

1. Acquisition of equipment essential to the operation of the programme at a top level of instructional and technical excellence.

2. The provision of such full-time, part-time, and/or short term consultants as may be required and agreed upon.

3. To meet the costs of travel and subsistence for such Indian personnel going to the United States for observation, discussion or specialized training activities, as may be necessary and agreed upon.

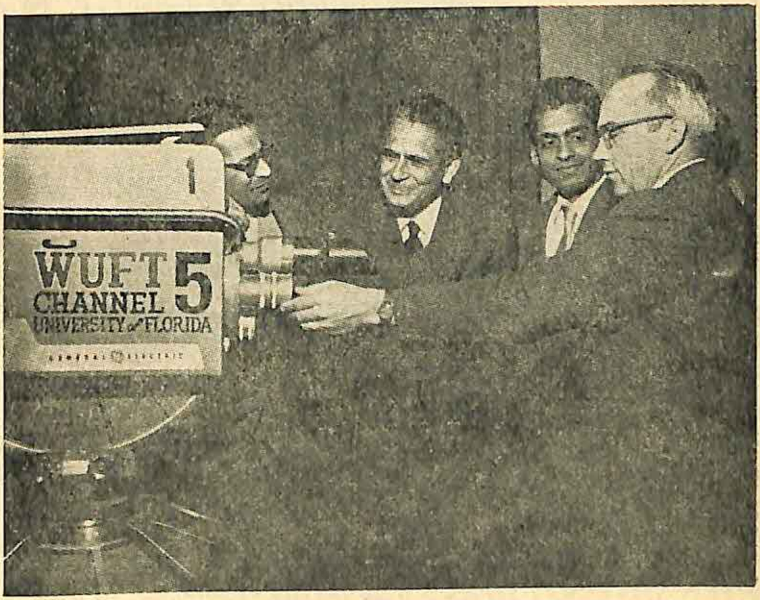
4. To meet, in part, the costs of such additional personnel in the All India Radio Television Unit, and the Department of Public Instruction, as may be necessary and agreed upon.

5. To meet, in part, the costs of conducting seminars, workshops and conferences for principals, teachers, and other personnel directly involved in the programme.

6. To meet, in part, the costs of assessment.

7. To meet, in part, the net added costs of required instructional material and supplies.

The project involved a good deal of preparatory work extending over a period of nearly eighteen months. Towards the

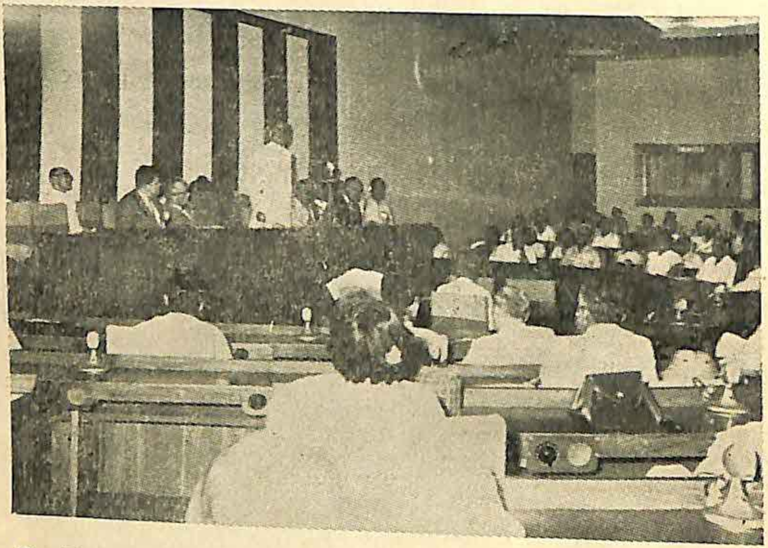


**The Pioneering Team**

**At Florida : Dr. Kenneth Christiansen (right) discusses TV equipment with (from left) Mr. P.V. Krishnamurty, O. S. D. TV, Mr. B.D. Bhatt, Director of Education and Mr. Narendra Kumar, Producer ETV.**

middle of 1960 the Director General of All India Radio paid a brief visit to the United States to finalize the arrangements with the Ford Foundation. He also visited some educational television centres imparting direct teaching through TV. Under the grant a senior engineer of AIR was sent to order equipment and also to study the working of the Video Tape Recorder. The equipment was ordered and shipped by the end of 1960.

In January 1960, the Director of Education, the TV Officer on Special Duty and the ETV Producer left for a detailed study of ETV Projects in the United States. The team also visited TV centers in London, Paris and Rome.



**The Minister of Information and Broadcasting inaugurating the first workshop. These workshops were attended by class-teachers teaching science and languages to class IX.**

On the return of this team, All India Radio organised a series of panel discussions with teachers nominated by the Director of Education. This was done to prepare tentative schedules in each subject and to involve teachers with a view to select a few of them for scripting, and presentation of TV lessons. The active and valuable co-operation of the British Council was sought in planning the English programmes. The subject-committees formed consisted of adequate number of classroom teachers, subject experts and principals well versed in the relevant subjects.

From 12th June to 1st July 1961, a comprehensive series of workshops of classroom teachers and school principals were organised in collaboration with the Directorate of Education and the Ford Foundation. Four experts from the U.S.A., Dr. Kenneth Christiansen, Dr. William Brish, Dr. Robert Hall and Mr. Paul Guptil guided the deliberations along with the Indian team.

These workshops aimed to inform teachers and principals concerning the ETV project; to involve them in the planning and development of the project; to provide AIR producers with an opportunity to experiment in the preparation and production of the in school telecasts; and to encourage prospective teachers to try for the TV teaching posts. The trial lessons transmitted during these workshops provided a concrete situation for the classroom teachers.

The workshops also gave final shape to TV schedules. For every subject, a detailed programme for the whole year was prepared; and the topics that had to be covered on TV, and those to be left to the classroom teachers were clearly identified.

**Group discussion technique enabled each participant to contribute freely.**

Group discussion techniques were freely employed. Probing, incisive questions were raised, reservations expressed, scepticisms and doubts manifested but all offered in a spirit of inquiry. More than 700 teachers and 200 principals participated. For the first time, such a big number of teachers and administrators participated in a common forum with their focus of attention on Delhi State educational programme, its philosophy, aims, purposes, curriculum procedures, needs and problems. The excitement of the forum was centered in the meaning of television and the new educational opportunity it can hold for the students. Thus the workshop created an environment of co-operation for the beginning of the project (For Time-Table of the workshops see Appendix 11).

The project was launched on 22nd October, 1961. On the eve of inauguration a special programme of one hour duration was put out for 'Parents and Teachers'. Among others the Union Minister of Education, Minister for Information and Broadcasting and the Ford Foundation local representative participated. The main aim was to acquaint the parents and teachers with the objectives of the project, and to display the advantages of TV as a teaching tool.

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# Aim and Contents

After a series of thoughtful and prolonged discussions among the Ford Foundation consultants, representatives of the Ministry of Education, Delhi Directorate of Education and A.I.R., it was decided to put out a programme of direct, systematic, organised, in school televised instruction; organised around and directly a part of the regular curricular offering in the school system; systematic and regularised on a schedule basis; sequential, that is, beginning with a selected starting point in subject matter and at a given level of instruction based on pupil achievement and proceeding sequentially, building one block of learning experience on another, direct instruction broadcast during regular school time and not outside the school hours.

It would have been possible to make these lessons enrichment programmes, but they would not have excited much interest among the school principals. The teachers are not in a position to spare time for an additional extra-curricular activity. The TV project had also to take into account, the prevailing disproportionately important role of the examinations in the schools. The fact that the school teacher and the principals are judged by the percentage of the annual results could not be ignored. Instructional programmes were to be transmitted due to a number of related factors:

(*a*) Rising curve of high-school attendance.

(*b*) Two shifts in schools. This means shorter periods, and less time at the disposal of the teacher to complete the prescribed course.

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(*c*) Knowledge explosion resulting in over-crowded school syllabi.

(*d*) Dearth of qualified teachers, and well-equipped science laboratories.

(*e*) Over-burdened classroom teachers : During a single day an average teacher has to teach a number of grades and also at times a number of subjects. Even a talented and serious-minded teacher finds it difficult to prepare and collect relevant audio-visual aids to present each lesson effectively everyday.

(*f*) Textbook lag.

Though the project is based on the principle of direct teaching, the aim is not to provide 'total instruction' in a given subject or to replace the classroom teacher. Direct teaching implies that the programmes are directly related with the school syllabus; and presented in a logical sequence, that portion of the syllabus which lends itself better to television. In other words, it would help the classroom teacher to accomplish his or her objectives better by bringing into the classroom additional resources and material, which cannot be provided for want of time, resources or training. The project thus would enable all the students to benefit equally from talented teachers ; best equipped laboratories and other audio-visual aids. Also, regular viewing would indirectly serve as in-service training to teachers, as they would observe superior teaching. This, in the long run, would result in better teaching standards.

A provision was also made to put out special teachers' training programmes to demonstrate the latest teaching techniques and new materials available.

For television teaching subjects were chosen in which there were inadequate facilities in the schools. This, it was felt, was very important for the success of any TV project aiming to supplement the work of the classroom teacher. The majority of schools in India are still insufficiently equipped for the teaching of science subjects. So Physics and Chemistry were selected as principal subjects. There was, and is, an acute shortage of qualified and trained science teachers. The TV teachers being the best available teachers in the State, provide better teaching to all the pupils. The TV screen, it was envisaged, will also make up for want of well-equipped laboratories and audio-visual aids; and enrich teaching. There was also a demand for assistance to classroom teachers in language teaching, specially in speech training. It was, therefore, decided that Physics and Chemistry would be taught thrice a week each, and English and Hindi once a week each.

To achieve the objective of direct sequential instruction on TV, it was essential that the TV lessons should be so devised and developed that the topic covered on TV coincides with the subject-area to be covered by the classroom teacher during the corresponding week. This factor was considered important, because a TV lesson, say on magnetism, may not be useful to a class studying electricity at that time. To ensure close relationship between the TV and classroom teaching, it was essential that all viewing schools should adhere to a *uniform weekly syllabus-distribution*, a uniform school time-table, examination days and working hours. At the initial stage, all this sounded like wishful thinking. But time proved that it was not so. In the very beginning it was made clear to the teachers and the principals that certain rigidities would have to be tolerated and endured to make the best use of this powerful mass medium, which has to be used in the most economic way. The workshops helped to evolve uniform syallabi and time-tables. This worked successfully as both the teachers and the principals were convinced that this was not something thrust upon them from above, but agreed to by themselves for achieving certain educational objectives. A sample of the school time-table, and syllabus distribution can be seen on the next two pages : pp. 24-25.

Very soon it was realised that an allotment of three lessons per week was not a very practical frequency. This was due to the distribution of the periods to the subjects in the school. In some schools teachers had 5 to 6 periods for teaching Physics. This meant TV lessons on alternate days. The teachers found it practically impossible to keep pace with the TV lessons. The grasping capacity and learning speed of the students differ from class to class. Some classroom teachers felt that TV was practically replacing them by covering a major portion of the syllabus and areas which could be successfully taught by an average teacher with limited resources. So the frequency was reduced from three to two per week. At a later stage it was

SUMMER TIMINGS (1st APRIL TO 30th SEPTEMBER)

| | *Ist Shift School* | *IInd Shift School* | *Single Shift School* |
|---|---|---|---|
| School opens | 7.00 a. m. | 12.30 p. m. | 7.30 a. m. |
| Assembly prayer | 7.00—7.10 a.m. | 12.30—12.40 p.m. | 7.30—7.40 a.m. |
| I Period | 7.10—7.45 a.m. | 12.40— 1.15 p.m. | 7.40—8.15 a.m. |
| II Period | 7.45—8.20 a.m. | 1·15— 1.50 p.m. | 8.15—8.50 a.m. |
| III Period | 8.20—8.55 a.m. | 1.50— 2.25 p.m. | 8.50—9.30 a.m. |
| IV Period | 8.55—9.30 a m. | 2.25— 3.00 p.m. | |
| | (Telecast from 9.00—9.20 a. m )<br>Physics—Monday, Wednesday, Friday | (Telecast from 2.30—2.50 a.m.)<br>Physics—Monday, Wednesday, Friday. | (Telecast from 9.00—9.20 a.m.)<br>Physics—Monday, Wednesday, Friday. |
| | Chemistry—Tuesday, Thursday, Saturday | Chemistry—Tuesday, Thursday, Saturday. | Chemistry—Tuesday, Thursday Saturday. |
| | | | (Telecast from 11·5—1125 a.m.<br>English (Monday)<br>Hindi (Saturday) |
| III Period | 8·50— 9.25 a.m. | 2.20— 2.55 p.m. | 11.30—12 10 p.m. |
| IV Period | 9·25—10.00 a.m. | 2.55— 3.30 p.m. | 12.10—12.45 p.m. |
| | (Telecast from 9·30—9·50 a.m.)<br>Physics—Monday, Wednesday, Friday. | (Telecast from 3·00—3·20)<br>Physics—Monday, Wednesday, Friday | |
| | Chemistry—Tuesday, Thursday, Saturday, | Chemistry—Tuesday, Thursday, Saturday | |
| Recess : | 10.00—10.25 a.m. | 3.30— 3.55 p.m. | 12.45—1.25 p.m. |
| V Period | 10.25—11.00 a.m. | 3.55— 4.30 p.m. | 1.25—2.05 p.m. |
| | | (Telecast from 4.05—4.25)<br>Englsh (Monday)<br>Hindi (Saturday) | |
| VI Period | 11.00—11.30 a.m. | 4.30—5.00 p.m. | 2.05—2.45 p.m. |

## Weekly Syllabus

| *Date and Topic* | *Suggestions* |
|---|---|
| 11·11.61<br>Expansion of Liquids | (*a*) Ideas of change with temperature (without density relation).<br>(*b*) Simple problems on linear expansion. |
| (T) 13.11.61<br>Expansion of Water | (*a*) Anomalous expansion of water showing that its density is maximum at 4°C (by Hope's apparatus).<br>(*b*) Importance of anomalous expansion of water in nature. |
| (C) 14.11.61<br>Expansion of Gases | (*a*) Experimental evidence of the expansion of gases.<br>(*b*) Applications. |
| (T) 15.11.61 | (*a*) Necessity of measuring heat and need for a unit.<br>(*b*) Definition of calorie and B. Th. U.<br>(*c*) Relation Q = mst. (Experimental verification) and definition of specific heat. |
| (C) 16.11.61<br>Calorimetry | (*a*) Thermal capacity and water equivalent and difference between them.<br>(*b*) Determination of water equivalent of a body (with precautions). |
| (T) 17.11.61 | (*a*) Determination of specific heat of a solid and liquid with precautions. |

agreed that the frequency should be mostly once a week, and only those topics should be selected for TV where there is ample scope for bringing additional resources into the classroom, which teachers cannot provide. Being encouraged by the impact of school TV, the Principals also agreed to make integrated use of radio lessons also.

## SCHEDULE OF SCHOOL TELECASTS AND BROADCASTS
1966-67

### Summer

| | *Monday* | *Tuesday* | *Wednesday* | *Thursday* | *Friday* | *Saturday* |
|---|---|---|---|---|---|---|
| I. 8.00 a.m. | Physics IX (TV) | Physics X (TV) | Physics XI (TV) | Chemistry X (TV) | Physics X (TV) | Chemistry XI (TV) |
| II. 9.15 ,, | English VII (TV) | English VIII (TV) | English VI (TV) | Gen. Sc. VII (TV) | Gen. Sc. VIII (TV) | Gen. Sc. VI (TV) |
| III. 10.50 ,, | S. Studies VII (Radio) | Chemistry IX (TV) | Hindi VII (Radio) | Gen. Know. IX (Radio) | English VI (Radio) | — |

### Winter

| | *Monday* | *Tuesday* | *Wednesday* | *Thursday* | *Friday* | *Saturday* |
|---|---|---|---|---|---|---|
| I. 11.10 a.m. | S. Studies VIII (Radio) | Chem. IX (TV) | Hindi VII Radio) | Gen. Know. IX (Radio) | English VI (Radio) | — |
| II. 2.00 p.m. | Physics IX (TV) | Physics X (TV) | Physics XI (TV) | Chemistry X (TV) | Physics X (TV) | Chemistry |
| III. 3.15 p.m. | English VII (TV) | English VIII (TV) | English VI (TV) | Gen. Sc. VIII (TV) | Gen. Sc. VIII (TV) | Gen. Sc. VI (TV) |

The following few examples would give an idea about the contents of the TV lessons :

1. In a TV lesson on 'Sources of Heat' the TV teacher developed the concept : Sun is the primary source of heat.

Developing this concept involved establishing a relationship between all the commonly known sources of heat, burning of coal, condensation of steam, hydro-electricity etc. with the sun. An inquisitive student of science would not be satisfied by mere telling. The TV teacher could establish this relationship very successfully by using still and moving pictures, models and experiments.

2. In a lesson on 'Effects of Heat'—all the effects: expansion, change of state, chemical effect, rise of temperature, mechanical and electrical effects were demonstrated through experiments in a 20 minutes telecast. TV thus helped students to learn faster and better.

3. In a lesson on 'Change of State' the effect of pressure on the boiling point was demonstrated by using a rotary vacuum pump and showing that water boils at ordinary temperature. Most of the schools do not have this precision pump and are unable to perform this spectacular experiment.

4. In a lesson on the Nitrogen Cycle, a film was used to demonstrate how atmospheric nitrogen undergoes a cycle of changes and ultimately reverts to the atmosphere.

5. In a lesson on the 'Dalton's Atomic Theory' idea of electron, proton and neutron was given to students by showing the movement of electrons the around protons. A science expert—a guest teacher explained the most recent modifications of Dalton's Atomic Theory.

Besides Science and Hindi programmes, to meet certain immediate needs, other special series of programmes are also put out from time to time. For instance during the national emergency caused by the Chinese aggression in January 1963, a special series of informative programmes on the following topics were covered :

1. National Defence and the Students.
2. Our Foreign Policy.
3. India-China Relations.
4. Our Northern Frontiers : NEFA, Laddakh, Sikkim, Bhutan, Nepal.
5. Map Reading.

In the academic year 1964-65 to celebrate the International Co-operation Year, a series of programmes were transmitted to bring out how international cooperation is essential because of inter-dependence for human prosperity and peace.

During the short conflict with Pakistan programmes on 'Air Raid Precautions' and "News from the War Front" were introduced.

## SERIES ON INTERNATIONAL UNDERSTANDING

Recently great emphasis is being laid on education in International Understanding. In India this has been one of the main ingredients of Indian life, culture and civilisation. "Vasudhaiv Kutumbkam"—the whole Universe is a family—has been one of the sacred ideals for the Indians since time immemorial. That is why the Father of our Nation, Gandhiji, always emphasised that "Just as the cult of patriotism teaches us that the individual has to die for the family, the family has to die for the village, the village for the district, the district for the province ; and the province for the country ; a country has to die, if necessary, for the benefit of the world. My love, therefore, of nationalism or my idea of nationalism is that my country may become free, that if need be, the whole country may die, so that human race may live... Let that be our Nationalism."

On International Understanding during the past three years, the following series were put out on Television :—

1. Our India : A series of features to acquaint the students with all the regions of India ; and depict Unity in Diversity.
2. Our Universe : Programmes on various countries.
3. The United Nations and Its Agencies : The stress was on depicting inter-dependence.

In our School Broadcasts on sound radio also, similar series are put out. Besides the above mentioned topics, the following topics are covered.

1. Children of other Lands.
2. Immortal Messages : Teachings of Buddha, Mohammed Paigamber, Christ, Lenin, Abraham Lincoln, Gandhi, Nehru, etc.

3. Interviews with foreign personalities, foreign children and Indians who have been abroad.

In these programmes, the emphasis is on what the classroom teachers and students can really contribute. For instance, in the programme on the "Fight against Hunger", the accent is on how students can contribute in the form of labour, money or ideas. With the help of their teachers, how they can grow a variety of fruits within the school compounds, devote attention to planting and protection of trees along road sides, grow at home kitchen-gardens and rear poultry. How they can talk independently to people at large about the principles of nutrition, need for changing food habits and stop them from wasting food. How they can organise exhibitions on "Low cost food for better nutrition", and propagate the use of better manure, seeds and modern agricultural implements to boost agricultural production.

Because of lack of listening and viewing facilities, all the classes cannot listen or view such programmes ; so teachers are requested to develop small projects round the programmes. The radio and TV programmes are put out once a week or once in a fortnight. Now suppose the programme on the 7th September was on Afghanistan. The teacher could assign a group of students to draw an outline of Afghanistan on the Wall-Board. Next day another group could be asked to fill in the mountains, rivers, towns etc. The third group could be asked to collect photographs of the people and places. This could be pasted on a big Card-Board. Yet another group could be asked to prepare a short note on the current Socio-economic developments, the countries helping Afghanistan to develop various projects; and the remaining students could be asked to have a glance at the project, and write a short note on Afghanistan. The teacher could also collect some addresses and encourage a few students to write to their counterparts for an exchange of information on respective countries. With minimum guidance from the teachers an environment could be created to inspire students to learn a few things about others.

Thus though the Delhi School Television project is mainly a direct teaching project, provision is there to utilize it for other worthwhile purposes also, within the limits of available technical and other facilities.

# Scripting, Presentation and Production

School Television schedules are prepared by subject committees consisting of curriculum specialists, classroom teachers and the subject experts, as related earlier. In the schedules the scope of each lesson is also given and this serves as a guide line to both the script writer and the producer. Normally the script writer is also the presenter. The producer is familiar with the medium, and is not necessarily a subject expert. The following questions arise. Who should be the script-writer-presenter ? Should an outstanding university teacher be assigned this job or a practising teacher from the school system ?

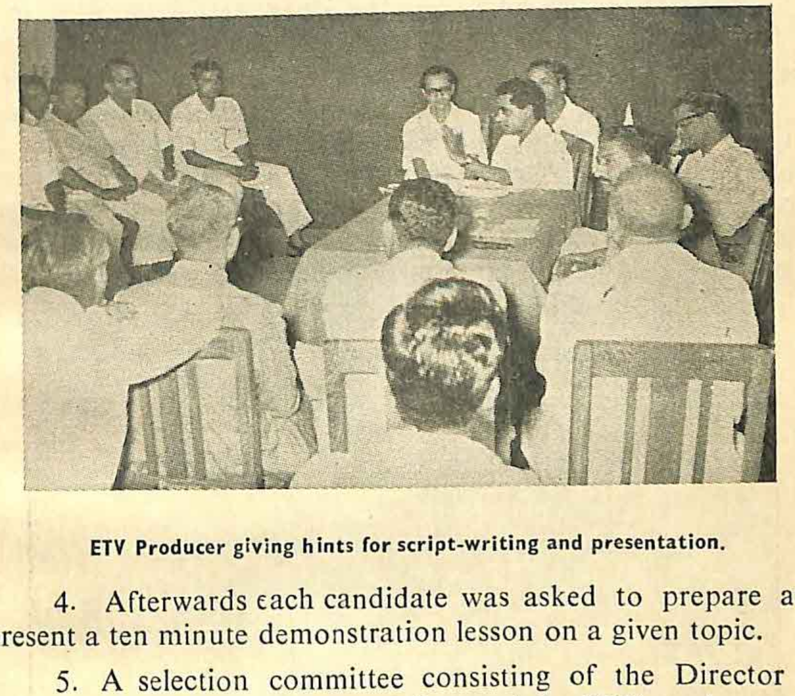
In India the planners of the project felt that, as a general policy, it would be better to employ practising teachers, as they are familiar with the prevailing classroom problems, and the needs and interests of the viewing students, and should therefore be selected for television teaching. On the other hand the university teachers could also be used as guest teachers.

The second problem posed is : Should the TV teacher be relieved fully for the TV work or on a part-time basis? Would it be advisable to uproot him completely from the classroom scene? If not, should there not be someone on the staff who provides constant link both for continuous presentation and for liaison with outside source-agencies like the Institute of Audio-Visual Education, National Physical Laboratory etc. With these problems in view it was decided to create two posts of subject supervisors : one each for Physics and Chemistry. These subject experts were deputed to the TV Centre by the Directorate of Education from among their senior science personnel. For presenting the TV lessons, a panel of teachers was constituted for each subject. The following procedure was adopted :

1. At the initial stage applications were invited from qualified and trained teachers from all secondary schools. All those aspiring to write scripts and presentation could apply.

2. In the beginning all the applications were screened by the Directorate of Education.

3. The selected candidates were then invited to the TV Centre to make them familiar with the studio environment, writing and presentation techniques and objectives of the proposed school TV project.



**ETV Producer giving hints for script-writing and presentation.**

4. Afterwards each candidate was asked to prepare and present a ten minute demonstration lesson on a given topic.

5. A selection committee consisting of the Director of Education, some subject specialists and the ETV producer was constituted for each subject.

It was decided that it would be worthwhile to have a panel of 5-6 teachers for each subject, rather than one permanent teacher on the TV staff. This might be advantageous for the following reasons :

(*a*) Fresh talent can always be invited.

(*b*) The TV teacher would continue to be in the classroom. It was envisaged that one person would present a series of programmes on heat, other on magnetism and so on. Now suppose the series on heat is to commence from 2nd August and continue till 5th of September, this particular teacher will be relieved in July (for the whole month) to record in advance his programmes. Then, when the TV lessons are transmitted he would use the same programmes as a classroom teacher. This will enable him to understand better the close relationship between the two partners : the TV teacher and the classroom teacher.

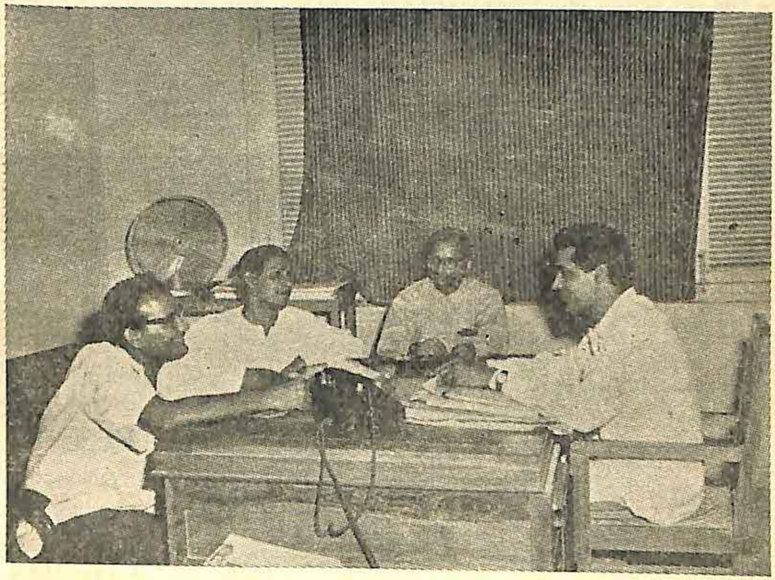
The subject supervisor, as described earlier, would serve as the continuing link. Unfortunately, because of a number of practical difficulties, this system of releasing the teachers for 4 to 6 weeks did not work. So it was decided that one permanent teacher for each subject would be appointed in addition to the subject supervisor. The system of having a panel of TV teachers for each subject continues. The panel teachers present lessons during their off time, once a month or so The search for fresh talent is a continuous process. Teachers are also selected for script writing only.

## Preparation of TV Lessons

The TV Centre assigns TV lessons nearly three months in advance. The broad outline published in the TV Schedule serves

The reference library of Central Institute of Education is a valuable source.

as a guide for preparing each TV lesson. Once an assignment is received by the teacher, he contacts the subject supervisor. A tentative draft script is prepared. Then follows the first planning meeting with the TV teacher, subject supervisor, the visual supervisor and the producer forming the production team. In this meeting details about the contents, visuals required, film and science apparatus to be obtained, and dates for dry rehearsal and taping are finalized. The outcome, in a draft form, is circulated to the members of the subject committee, and then discussed with them. All their suggestions are noted, and as far as possible implemented. But the final responsibility lies with the production team. All scripts are not routed through this committee. It depends on the convenience of the committee members and also that of the TV Centre. Sometimes time does not permit screening of scripts. In some cases the need is not felt. Subject committees are convened depending on the nature and scope of the topic to be presented. Resources of the Department of Audio-Visual Education, the National Physical Laboratory and Department of Science Education have been used. The TV Centre is also building up its own laboratory, reference library, model making section, film library and visual section.



The Production team.

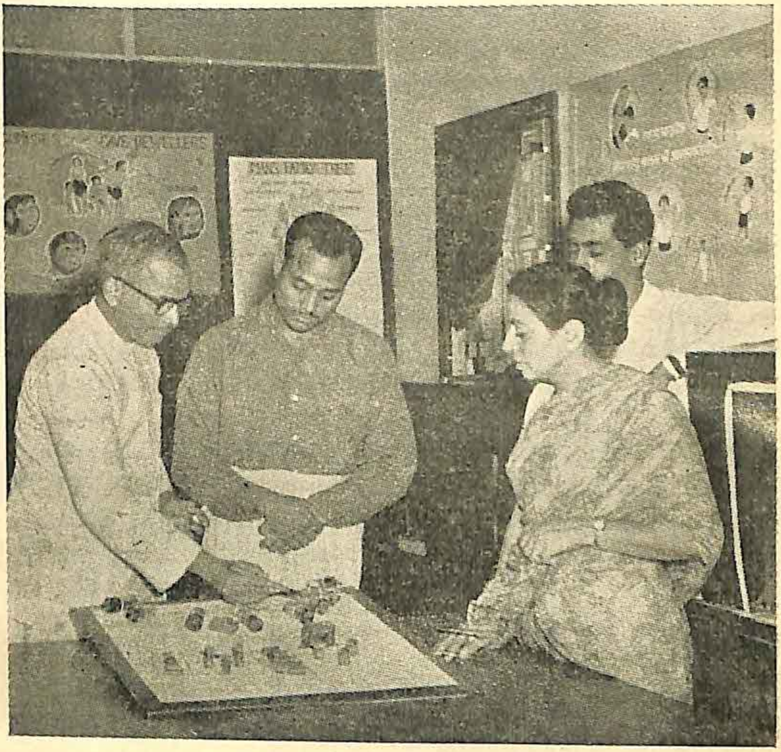
Two dry rehearsals and at least one camera rehearsal are deemed essential for taping a programme. A lesson of 20 minutes duration, generally speaking, takes three hours of Studio-Time. Because of two shifts in schools, each lesson has to be repeated, so all school TV lessons are taped. This also ensures quality and accuracy.

### Who should be an ETV Producer-Director ?

A person having sound knowledge of TV production *or* a person fully conversant with the TV medium as well as the teaching techniques *or* a teacher-producer knowing the medium as well as the subject ? All India Radio has the policy that only trained and experienced teachers may be recruited as educational broadcast producers. This policy is based on the experience that, generally speaking, producers of entertainment Radio-TV are not familiar with the requirements of schools, and find this assignment dull. So practically all school broadcasting producers are ex-teachers, but not necessarily subject specialists.

In a scheme of direct sequential instructional teaching, what would be the role of a producer not knowing the subject ? Production of a TV lesson is a three stage process : (1) planning, outlining organisation and ordering of the content ; (2) show-casting the content for the TV medium ; and (3) the final production either live or on video tape.

The TV teacher and producer are to be involved in all stages. The producer is involved in the planning, outlining and in the organisational stage of the lesson. The TV teacher and the subject supervisor have responsibility to identifiy those lessons which are to be TV lessons, the sequence of the lessons, the content in broad outline, demonstration and experiments to be performed, the educational prescription. After this the TV producer sits in conference with the teacher, subject super-visor, visual aid specialist, and discusses the appropriate visuals for the opening or introduction of the programme and plans necessary visuals for clarification and impact ; he gives suggestions and helps plan the pacing and flow of ideas for their attention or the problems that cannot be surmounted in terms of space, personnel and facilities of the studio. He senses at this stage the production requirements and evaluates the potential value and interest index for achievement. If the teacher succeeds in making the producer understand the subject matter the success of the lesson is assured to a great extent.



**The TV team**

**Selecting visuals at the Department of Audio-Visual Education.**

Recently productions have been assigned to Subject Teacher-Producers. Some of them have been abroad also for training in television production. It is too early to comment, but being a subject specialist, the Teacher-Producer has the tendency to sacrifice presentation fineness and to over-emphasize teaching points. Such a tendency may prove suicidal in the long run, because the students exposed to entertainment TV expect similar standards of imaginative and interesting presentation in the school TV lessons also. In any case, each time [before taping the lesson, the producer should ask himself these questions :

1. What have I tried to convey ?
2. Could I convey it more clearly
3. Have I exploited the medium ?
4. Are the visuals effective ?

5. Would the TV teacher hold the attention of the viewers throughout the lesson ?

6. Will the lesson be an aid to the teacher ?

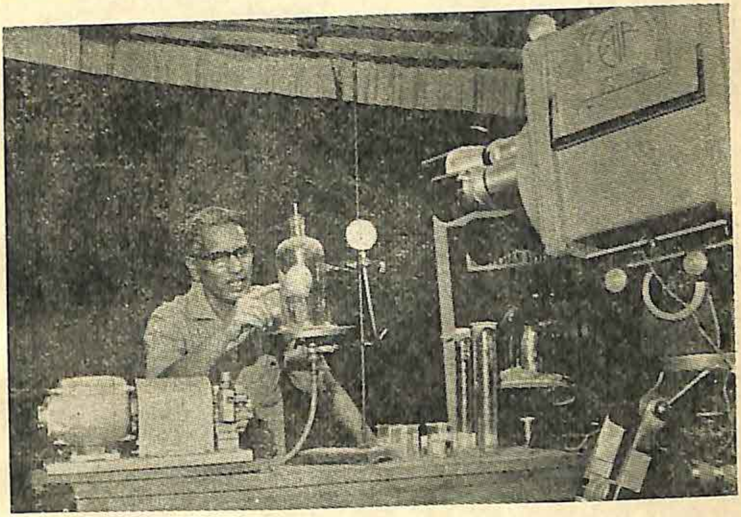
7. Is there scope for active participation by students or will they be just passive viewers ?

8. Are some real problem situations presented to give students a chance to draw their own conclusions ?

TV production is undoubtedly a team job, but the total result depends on the fibre of each individual, each making a particular contribution to present a lesson excellent from the point of view of both subject matter and a work of art. The producer has to play the key role by absorbing fully what the specialist wants to convey, and then translating it into the language of television.

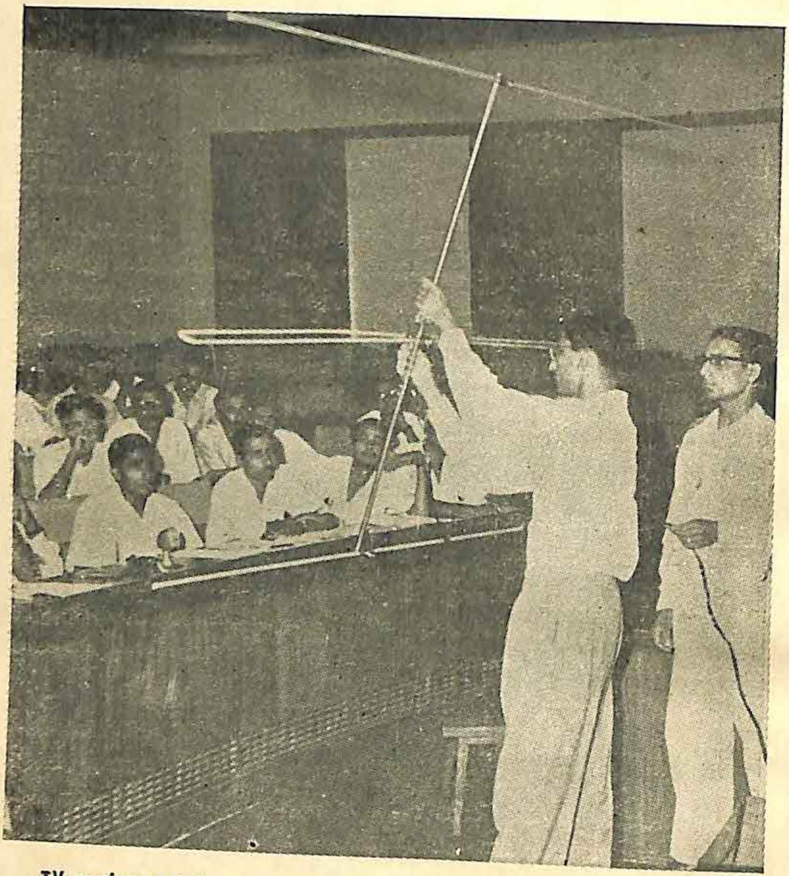
# Classroom Utilization

For effective and meaningful classroom use of any mass media of education, there are three pre-requisites : Natural and undisturbed reception, comfortable seating arrangement, and carefully pre-planned preparation and follow up activities by the classroom teacher. Imagine a crowd of more than 200 youngsters viewing a TV lesson sitting on the floor in a big auditorium; or a group of a hundred viewing in an overcrowded classroom. It's not only a fruitless exercise but torture to the young ones. School TV programmes have to be viewed in the natural classroom environment under the guidance of the subject teacher. Then only can the students concentrate and participate actively in the learning process.



A physics lesson in progress

Similarly, good reception is a basic necessity for purposeful viewing. For this not only should the TV set be in order, but the teacher should also know how to handle it properly. No one would expect him to replace a technician, but he must be well-conversant with the handling of the TV equipment.

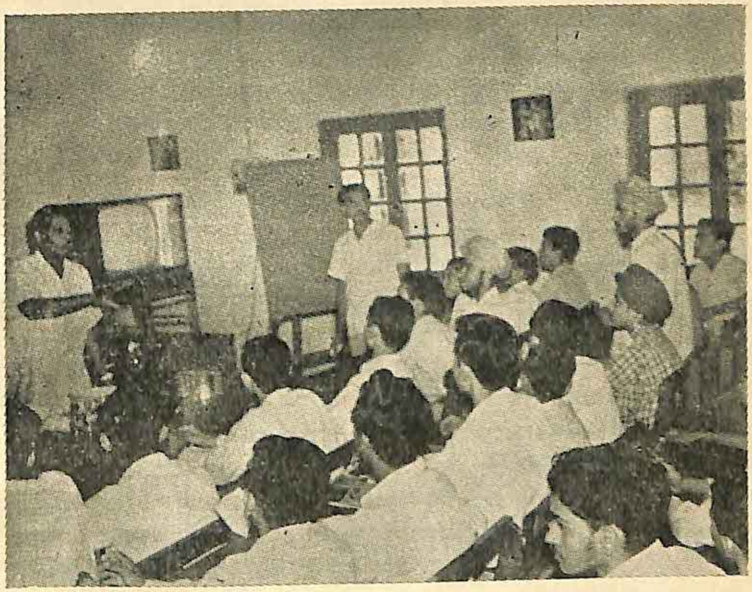


TV engineer giving some useful hints to the teachers regarding the handling and maintenance of TV set.

In the Delhi project, All India Radio has also taken over the responsibility of installation and maintenance of the TV sets. The TV technicians go round the schools to check and repair sets. Some sets are kept in reserve by AIR. If a TV set cannot be repaired on the spot, it is brought to the workshop; and a working set is given, so that the school may not miss any lesson.

A TV lesson is only one part of the learning procedure in the classroom. The other two equally important parts are the preparation and follow-up activities to be conducted by the classroom teacher. Without these, the TV lesson loses much of its instructional significance. To enable the classroom teacher to pre-plan these activities, guidance notes for each lesson are supplied to each subject teacher in advance. It includes broad outlines of the content of the lesson together with suggestions for preparation and follow-up work (Appendix III).

Preparation and follow-up activities would certainly differ from class to class depending on the standard of the class, and the initiative and imagination of the class teacher. However, broadly speaking, preparation could be brief aiming at introducing the student to the topic to be covered in the day's TV lesson. It should create inquisitiveness among the students to know more about the subject. In the follow-up, after clarifying the points or doubts raised by the students, the class should go ahead with planned activities.



The liason officer demonstrating how to prepare the class before a TV leason.

For example, suppose the TV lesson is to demonstrate essentials of a good thermometric substance. Before the TV lesson, the classroom teacher may ask about the necessity of measuring temperature; display a few varieties of thermometers, and ask why mercury is normally used ? Of course, the students would not be able to answer, but then the teacher can say—alright, try to find out the answer in today's TV lesson. Such a pointed query would lead the students to view the programme with an alert and searching mind.

The classroom teacher has to play an important role during the transmission time too. The class teacher's approach and outlook towards the medium would be reflected by the class. So to encourage the students to view the lesson with full attention and concentration, he should also join them and view the lesson with utmost attention. The tendency of the students to jot down long notes should be discouraged. It is observed that if the students get involved in writing, they soon miss the link; and once this happens further viewing becomes meaningless. If they are keen, they can jot down key words here and there without turning eyes from the TV screen or when the TV teacher is repeating a particular point. One important point is that when the TV teacher poses a question or asks students to pronounce or repeat a new word or phrase, the classroom teacher should ensure that the whole class responds simultaneously. If need be, the classroom teacher should join the class in such activities. He should ensure that the students do not become mere passive viewers but participate actively.

After the TV lesson, the teacher may ask questions to ascertain how much the students could grasp, and what was not clear enough. He may also give some supplementary information, and then go ahead with a project of constructing a thermometer and its graduation in the present case. Sometimes, the teachers complain that, as the period is of 35 to 40 minutes' duration, there is not enough time for preparation and follow-up activities. In a project closely linked with the prescribed curriculum, such problems really should not be very difficult to manage. After all teaching is a continuous process. What is covered on TV is not something additional. Proper ground for the reception of the lesson can be prepared, even on an earlier day in keeping with the nature and demands of the TV lesson. The follow-up too can continue either on the same day or the day after.

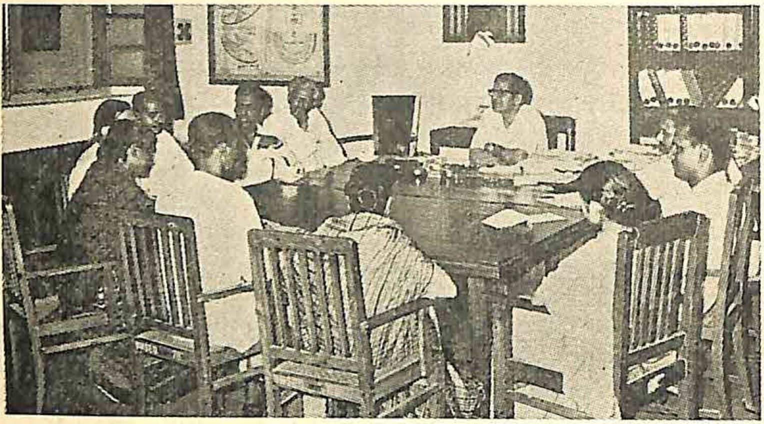
# Evaluation

Evaluation is an integral part of effective planning. Every broadcasting organisation considers assessment of programmes as important as production, because the value of a broadcasting project is only as good as its utilization. If a programme is not profitably utilised by those for whom it is meant or who would profit most from it ; or if it does not suit the needs and interests of the target audience; or if there is not the remotest possibility of inducing even a section of the listeners to develop a taste for the programmes, such a project need not exist. For progressive improvement in the service, it is essential that the producer knows which of his ideas have been successfully conveyed, and which have failed to hit the target and why. This is more important in special audience programmes like school broadcasts. So, for a constant two-way flow of information between producer and user; and to seek the guidance of the school principals and teachers, the following steps have been taken :

1. *Daily contact through correspondence* : Every classroom teacher is expected to send in an evaluation check sheet on each telecast utilized by him. For this the TV centre provides a printed pad of check sheets at the beginning of each term to each teacher.

These sheets mention the quality of reception, suitability of the subject matter, quality of presentation, reactions of the students as well as the teacher, and suggestions for further improvement. (Appendix IV.)

At the TV end the information received is tabulated and passed on to the relevant production team and the members of the subject committee. Suggestions regarding the suitability unsuitability of the topic are noted and considered at the time of planning meetings.



**The Director of Education having an evaluation session with liaison officers, TV teachers and producers**

2. *Personal contact through visits*: For constant liaison with schools two posts of liaison officers have been created. These persons are also deputed to the TV Centre by the Directorate of Education. One of these is a senior Assistant Director of Education. Because of his official standing, he can freely advise the principals in properly organising viewing in the schools. He ensures that the school time-table and the weekly syllabus—distribution laid down by the Department to enable regular and meaningful utilization of TV lessons, create no difficulties in the smooth running of the administration of schools. The other liaison officer is of the rank of Inspector of Schools. He concentrates on the actual classroom use of the lessons, and gathers first hand impressions of the reactions of the students and the teachers. (Appendix V.)

Television is the most effective medium yet devised for learning. Its effectiveness and its impact upon instructional practices would depend on how intelligently and imaginatively the TV lessons are presented; and how skilfully they are integrated into the classroom routine by the classroom teachers. In using any mass medium, the last word always lies with the classroom teacher. Much depends on his convictions and cooperation.

The inspecting staff of the Directorate of Education also makes a note of the viewing situation and TV's impact on the students. Relevant extracts from inspection reports are passed on to the liaison officer TV for information and necessary action. The additional advantage of this arrangement is that the schools feel that school television is one of the activities of the Directorate of Education.

The TV supervisors, teachers and producers also visit schools during transmission hours. They view the programmes with the class and gather first-hand impressions of the students as well as the teachers. Such visits prove very beneficial. For the TV teacher, it's a thrilling experience to observe his own performance. It's self-education. It makes him aware of his own good and bad points—mannerism, pace, language used etc. This helps tremendously in improving future performances, provided one goes with an open mind. Visiting schools is also a gainful experience for the producer.

3. *Meetings of Teachers and Classroom Principals* : Besides the annual meetings, periodical meetings of classroom teachers and principals are organised. These are organised on an area-wise basis. Teachers of a small group of schools in a particular area meet in a centrally situated school at a convenient time. These meetings are organised by the TV liaison officer and are attended by producers and TV teachers also. Discussions centre round the following points:

1. Viewing end problems : Seating arrangement for the students, quality of reception, classroom integration of TV lessons *i.e.*, nature of preparation and follow up activities, and response of the students.
2. Suitability of the TV topics, content of the lessons, presentation techniques, personality of the TV teacher, production quality.

   These meetings are so arranged that the group can view a TV lesson in the school, and also observe preparation and follow up activities conducted by the classroom teacher. (Appendix VI.)

4. *TV News Letter*. To establish better contacts with the schools, a monthly TV News Letter has been brought out since January, 1963. This provides a forum for the teachers to convey their thoughtful reactions and practical problems. A number of

academic questions like syllabus, teaching techniques etc., are also discussed through this channel.

5. *Periodic Evaluation Projects.* Special projects to evaluate various aspects of the project : for example, once students of an average school were asked to write a summary of a television lesson both before and after follow-up by the class-teacher. The result showed that the students were able to improve, to a considerable extent, their scores after the follow-up. This test established the necessity of the follow-up activities immediately after the telecast. Another test was conducted to obtain information on the point of student retention of TV lessons after a gap of few days. (Appendix VII).

Towards the end of 1962, a survey was conducted to assess if the students of Class X understood science lessons presented through English medium. It was found that even in English medium schools, the teachers use the vernacular frequently for explanation and elaboration. So from January 1963, science lessons for Class X were also presented on the pattern of Class IX *i.e.*, technical terms and definitions in English, and explanation in Hindustani.

Similarly in 1962, in his preliminary survey, Dr. Paul Neurath pointed out the problem of interlocking and rigidity, because of the thrice a week frequency of the science lessons. Dr. Neurath's opinion was that "It is very difficult to arrange the sequences of lessons in a science subject in such a manner that every third lesson lends itself well to teaching by television. Besides, the present form of the syllabus takes all the flexibility out of the teaching process. A teacher who has assigned to him the content of his lessons for everyday for a whole year has practically no possibility to extend discussion of a topic into the next period if he finds that the students have not understood it or lead into a stimulating discussion."

There were other problems too. The TV schedules were drawn, and are being drawn, with the assumption that a teacher is provided six periods each week for teaching Chemistry and Physics. But in actual practice, for want of time, there are quite a few schools which provide less than six periods. Then again some class teachers had been under the worng impression that the portion covered on TV is none of their concern. They used to concentrate on the portion assigned for classroom teachers.

Taking all these factors into consideration the frequency of the TV lessons was reduced. It was also emphasized that TV only helps the teacher by bringing in additional resources and by demonstrating the latest teaching techniques. It is the classroom teacher who is solely responsible for completing the whole syllabus. The TV teacher and the classroom teacher form a team, there is absolutely no question of replacing the classroom teacher even on the day of TV lesson. 50% of the time on that day too is exclusively at the disposal of the class teacher, and he is the master of the whole situation. What impact the 20 minute TV lesson can have depends on his ability to use the resources brought in through television.

After an initial experiment of putting out lessons for Class IX, the language lessons too had to be changed. The emphasis in these lessons was on speech training. The principals suggested that the language lessons would be more helpful if put out for the beginners. The Education Department was facing yet another problem. The department had asked the schools to follow the structural approach to the teaching of English Language, but the teachers were not trained. So it was decided to drop the lessons for Class IX and instead put out two lessons per week in English for Class VI to help and guide teachers to adopt the structural approach.

Before starting the English project, a series of six seminars were arranged for the English teachers. The purpose of th seminars was three-fold :

1. To explain the aims and objects of starting English television lessons for Class VI ; and to acquaint the teachers with the theoretical and practical considerations involved in the structural approach to the teaching of English.

2. To orient the teachers into the ways and means of proper co-ordination of the TV and classroom lessons.

3. To have an open discussion with the general body of teachers, on the necessary implications of this programme.

The general plan of the seminars, each extending over a period of three days, was as follows :

1. Theory and practice of the structural approach to teaching of English as a foreign language followed by a demonstration lesson and discussion.

2. TV as a teaching medium.
3. Screening of three TV lessons followed by discussion.
4. Demonstration of follow-up practices.
5. Orientation in handling and manipulation of TV receiver set.

1. The whole project of *Teaching Through the Structural Approach* was organised in active collaboration with the British Council. Gradually a TV cell has been organised in the British Council to plan, prepare scripts and to conduct Teachers' seminars. The English TV lessons have now been extended to Classes VII and VIII also.

Thus constant and regular assessment is necessary for building up a really useful ETV project. It helps considerably to gear the programmes to the immidiate needs of the school system.

# Design For Future Expansion

The rapid expansion and heavy enrolments at the primary and middle school level made it impossible for India to provide adequate facilities and enough teachers for the educational task of the nation. The situation remains aggravated because there are proportionately fewer qualified teachers available each year, as the better educated tend to accept more promising employment in industry. The pupil-teacher ratio has risen, and, at present, at the primary level is fifty to one.[1] The need for more teachers has led to the employment of minimum qualified or sub-qualified teachers. Most middle and primary school teachers are only higher secondary school graduates, and do not have the required two years of teacher training. It is hoped that at the end of the Third-Five Year Plan (1965-66) through in-service training, seventy-five per cent of the teachers would have received teacher's training.[2]

To provide in-service training to teachers of elementary schools, an Institute of Educatian has been established in each State. The Central Institute of Education plans to begin correspondence courses for untrained teachers. In addition, short-term orientation courses, seminars and workshops have been organized to introduce teachers to educational methods and new teaching techniques, with special emphasis on how to handle large classes.

Despite these endeavours to improve education, because of the large turnover in teachers and the lack of teaching materials,

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1. *International Year Book of Education* (Vol. XXVI ; 1964), p. 150.
2. Taylor, *op. cit.*, p. 409.

the quality of teaching remains bookish, mechanical and stereotyped. Teaching is still a poorly-paid profession and many people enter the profession as a last resort. Having little incentive, the average teacher has neither the opportunity nor the inclination and capacity to develop self-reliance and independent thinking in his students. Teachers continue to impart information far removed from the interest and experience of the child. The only expectation from the student is that of demonstrating skill in memorization. No attempt is made to cultivate independent, free inquiry and original thinking.

The textbooks prescribed and in circulation are poor in quality, unsuitable, and often outdated. The syllabi have not been graded sufficiently and consequently there is much repetition of material.

An effort is being made to provide suitable textbooks and syllabi at all levels of education. Several States have nationalized text-books. The Central Committee on Educational Literature has prepared new text-books which are being tried out in selected schools. The National Council of Educational Research and Training is also bringing out cheap reproduction editions of foreign text-books and teaching materials.[1] A major problem is the lack of reasonably-priced text-books as there is a shortage of paper and printing presses. Further, foreign books have to be translated into Hindi and the other major languages of India and adapted to the Indian situation before they can be printed. "A uniform, all-India educational system embracing textbooks, curricula, and teachers' training programmes, is impossible with the present multilingual situation."[2] Teachers must be familiar with the language and the subject. On the whole, primary and middle level education is insufficient and barely prepares the students for the requirements of the higher secondary classes.

Progress in the quality of education is slow as the innumerable problems of reorganization and providing facilities are formidable. These problems are, nevertheless, common to all countries pledged to laying foundations for sound education.

The first problem is that, education requires heavy expenditure of public funds in every country, where the

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[1] *International Yearbook of Education* (Vol. XXVI, 1964), p. 152.

[2] Taylor, *op. cit*, p. 430.

> goal is free and universal schooling. Second, there are usually shortages of all kinds that have to be met, shortages of trained teachers, school buildings and teaching materials, facilities for training teachers and research in educational methods and techniques. And third, there is a continuing need for experimentation and change in educational progress, which is reflected in the necessity to update and diversify curriculum, textbooks and other teaching materials. Also required are periodic reviewing and revising of methods of presenting subject matter to improve the quality of teaching, to extend scarce resources to the ever increasing number of students and keep pace with the changing needs of the country.[1]

The education planners have made sincere attempts and devised measures to extend and improve the quality of education. The goals are far from being achieved in middle and primary schools. A review of the government report, *Education in 18 Years of Freedom*, in the Statesman noted that "Education at the primary level was appalling",[2] and quoted the Education Secretary, P. N. Kirpal as saying in the preface to the report:

> While we are proud of the substantial achievements in the field of education we are not complacent in as much as we are alive to the existing disparities. Desperate efforts are afoot to even out these disparities so as to give content to democracy, secularism, national solidarity and socialism—the four cornerstones on which we plan to reconstruct our existing educational system.[3]

In view of the critical situation in Indian primary and middle level education, television could be introduced to explore and experiment in improving teaching and learning standards. The framework of design for introducing television in the higher secondary schools could now be elaborated and extended along the existing pattern to other subjects and class levels as the need arises. The progression of the design both upwards in the higher secondary schools and downwards in the middle and primary schools would complete the form and provide, for future use, a complete model for other parts of the country. Each stage of

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1. *Taylor, op. cit.*, p. 429.
2. *The Statesman* (Delhi), January 2, 1965 ,p. 6.
3. Ibid.

progress would be carefully considered and tested to make sure it serves the right ends.

Primary schools are particularly suited to experimentation as there are no pressures of terminal public examinations. This would allow for considerable freedom to develop suitable curriculum which can be tested in the compact area of Delhi State. Further, the Delhi school population is fairly heterogeneous and has representatives of all parts of the country. Also, there are the resources of the National Council for Educational Research and Training. The Teacher Training Institute, Central Institute of Education, and the Department of Science Education, can be used for planning the programme. These institutes are already concerned with educational planning and policies.

### Proposed Design

It is proposed that instruction be given in the following subjects: Science, new mathematics, general programmes, and Hindi. (It is assumed that the television lessons in English language would be continued for Classes VI, VII and VIII. In the design it has been assumed that the plans to extend social studies programmes to cover Classes VI, VII and VIII would be implemented.)

The gradation of the introduction of television instruction in the school for a three-year period should be as follows:

> In the first year, the primary schools would receive general programmes for Classes I and II, New Mathematics for Class IV, and Science for Class V.
>
> The middle schools, Classes VI, VII and VIII would receive television instruction in English, General Science and Social Studies.
>
> In the following year, at the primary level, the first series on general programmes would be retained for use of Class I and a new series designed for Classes II and III. Hindi would be introduced in Class III. Science and New Mathematics would be extended to Classes IV and V respectively. In the third year, the general programmes would be extended to Class III, Hindi for Class IV, and New Mathematics for Class VI.

The progressive development of the programme schedule has been summarized in Table III. (P. 53.)

The following section elaborates the objectives of the new series.

### Science

The programme in science at the primary level would have the following purposes: to train the child to observe and express observations accurately; to provide practical knowledge and experiences closely related to the daily needs of the child and to develop an understanding and explanation of the underlying principles and knowledge of the human body, plant and animal life.

At the middle school level, science courses would aim to develop a taste for scientific investigation, history, and principles necessary for fundamental life; stimulate interest in the sciences by presenting adventures in the world of science; and bring the expanding frontiers of science and its new discoveries into sharp focus which would include a study of the scientist's work, his influence on the pattern of industry, and the social implications of science. The presentation of science lessons would be rich in information and new techniques, adequately used and applied, and would provide the class teachers with valuable in-service training.

### New Mathematics

The present curriculum for mathematics at the primary and middle level includes the teaching of numbers, weights and measurements, simple accounting, time and speed, and decimal fractions. Applied mathematics is not taught. The current study of mathematics aims to teach mathematical aspects of everyday life, training in reasoning, abstraction and judgment, preparing the students for the higher secondary classes. The method of teaching is usually graded examples of mathematics with other subjects, including physics, economics, geography, and social studies. However, the activity method is generally not used and correlation is rarely done.

It is suggested that new mathematics be introduced in the middle schools in preparation for the new courses planned in science at the higher secondary level. New mathematics brings a rich interdisciplinary approach to the everyday application of mathematics. New mathematics aims to develop the capacity to interpret one's environment from a quantitative point of view, and such things as comprehension of mathematical relationships, graphic representation of spatial relationships, and a research attitude and powers of analysis. To teach the new mathematics would require the use of illustrations and diagrams to develop an eye for accurate judgment, logical skills and precision in the use and interpretation of language, all of which are vitally necessary for the solution of problems in various fields.

The University Grants Commission arranges summer institutes for teachers of science and mathematics to introduce these new methods and courses under the guidance of expert teachers invited from the United States. In Delhi, television could be used to accelerate introduction of these courses. Teacher training programmes made with the assistance of these visiting professors would be televised to reach a larger number of class teachers than is possible under the present summer institute programme.

### General Programmes

General programmes would include emphasis on art, humanities, and science. These programmes would develop basic skills and stimulate the students' interest in a variety of subjects, vitalizing the meaning of education and linking subjects and constantly relating the local to the national and the world. Such programmes would introduce the students to India's crafts and rich cultural background, the meaning of citizenship, and the interpretation of current affairs.

### Hindi Language

The teaching of the Hindi language is herein suggested because it is the policy of the Indian Government to encourage its spread. New techniques and a new curriculum for the teaching of Hindi need to be developed, such as have been developed for the teaching of English. The experience gained in this area would be useful when Hindi is introduced to other parts of the country, areas to which it is not native and is taught only as a second language. Tests could be made to check and evaluate the success of the methods used in teaching.

Television instruction in English and social studies would be continued in its present form for the middle schools' Classes VI, VII and VIII.

## TABLE III

### Summary of Programme Schedule

| *Classes* | *I* | *II* | *III* | *IV* | *V* | *VI* | *VII* | *VIII* |
|---|---|---|---|---|---|---|---|---|
| 1961-1966 | | | | | | $E^2$ | $E^1$<br>$GS^1$ | $E^1$<br>$GS^1$<br>$SS^1$ |
| 1st year | Gp | | | M | S | | | |
| 2nd year | | Gp | H | S | M | | | |
| 3rd year | | | Gp | H | | M | | |
| Summary : | Gp | Gp | Gp<br>H | M<br>S<br>H | S<br>M | $E^2$<br>$GS^1$<br>M<br>SS | $E^1$<br>$GS^1$<br>SS | $E^1$<br>$GS^1$<br>SS |

Key :

E—English Language
GS—General Science
SS—Social Studies

Gp — General programme
To include art, music, story, health-science, science and social studies.
M — New Mathematics.
S — Science.
New discoveries, and adventures in science.
H — Hindi Language.

The number denotes frequency of lessons per week. The programmes indicate series designed for simultaneous use of two classes.

The design does not attempt to develop the syllabus or course for suggested subjects. The following guidelines for curriculum planning are recommended :

The objectives of the course (or curriculum) are subjected to a thorough operational analysis, and these objectives are then restated in detail and are expressed in terms of desired student behaviour. In other words, what should the learners be required to know and do as a result of studying the course? Such terminal behaviour will not be expressed in a paragraph or two of generalities ; it should be described in a number of pages of detailed behavioral requirements.

With carefully defined behavioral objectives it is not difficult to build appropriate tests which will assess whether the students can achieve the desired goals. At the same time performance standards can be specified.

Next it is appropriate to think in terms of the content that will be required to provide the necessary knowledge that students will need to meet the behavioral requirements. Organizing or structuring the subject matter for optimum learning and making decisions about the most appropriate method of presenting are the next steps.

Here it is appropriate to consider the use of a variety of learning situations. In addition to the main materials and methods of presentation, thought should be given to the development of appropriate supplemental materials. Ample opportunity should be provided for students to practise what they are learning and to receive appropriate reinforcement through knowledge of progress.

### Relationship between the Department of Education and the Television Centre

In the formulation of the school television design it had been planned that the project would be the joint working responsibility of All India Radio and the Department of Education.[2]

To increase the interest and participation of the Department of Education, consideration is being given by All India Radio to arranging the planning and preparation of television lessons in the Science Centre, recently created by the Department of Education for promoting science education. This unit arrangement is along the same pattern as has been established for the preparation of English lessons, on the premises and under the direction of the British Council. Similar units would be created for other subjects to be covered by television.

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[1] Leslie P. Greenhill, "Research on Instructional Television Past and Future, *Improvement of Teaching by Television*, Barton L. Griffith and Donald W. Maclennan, eds. (Columbia ; University of Missouri Press, 1964), pp. 19-20.

[2] In actuality of operation, the Department of Education has not taken an "active part in the educational side of the programmes beyond providing the syllabus and deputing teachers" to the Television Centre. The whole initiative, formulation and development of plans, execution and implementation of the plans for the school television has been carried by All India Radio and the Television Centre (*Neurath, Educational Television in India*), *op. cit.*, p. 385.

This plan is recommended since the Television Centre has not been able to provide facilities for television teachers and cannot provide a budget for a staff of subject experts, educationists, and highly qualified teachers. For expert advise the Television Centre has been entirely dependent upon the Department of Education and the various national institutes. These departments have not always extended their cooperation to the Television Center because of the commitments and heavy schedules of their staff. The Department of Education has been reluctant to assign selected teachers for television work. Because of rigid rules of deputation it has withdrawn experienced television teachers and returned them to their schools. Also, television teachers sent abroad on their return have been promoted and are no longer available for television work. (In part this is true for all areas of government civil service, seniority is the recommendation for advanced training and promotion.)

This in effect makes it increasingly hard for the Television Centre to cope with increasing commitments and maintain a standard of teaching in the television lessons.

There are two problems in the suggested plan, firstly, the present staff of the Science Training Centre is not sufficiently qualified to guide and direct the preparation of television lessons. Either more qualified staff would have to be appointed or the present staff should be given intensive training. Secondly, transportation would have to be provided for teachers and producers to commute between the Science Training Centre and the Television Centre.

In view of the above and to plan for the future and for the survival of school television, a high-level meeting should be arranged between the Director of Education and the Director of Television to clarify the role and responsibility of each department, to assess the present facilities and staff offered by each department, the operational practices and administration of all departments; procedures for obtaining more television sets for use in the schools, arrangements for maintenance; and the cost of publications. Attention should also be given to the recruitment and training of highly qualified personnel, and to the search for ways and means of retaining experienced manpower.

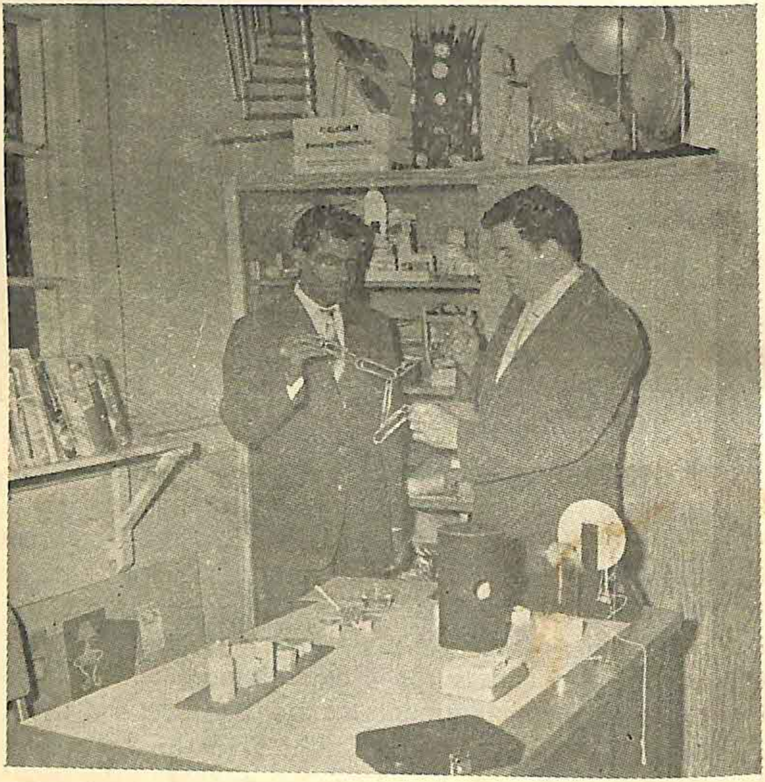
### Assessment of Television Centre's Facilities and Recommendations

*Studio.* The present commitments of school television are thirteen to eighteen lessons per week which are produced in thirtysix hours of studio time. This means that each lesson is produced in approximately two to two and a quarter hours. The time allotted for production is insufficient to do a satisfactory programme.

As initially planned, Akashwani Studio should be entirely available for school television and the auditorium studio for evening programmes.[1] Since television in America is changing from monochrome to color, monochrome cameras can be bought for bargain prices. This is an opportunity which should be considered carefully.

### Office Space

There is a general shortage of office space in the Television Centre. Reorganization of offices could improve working conditions. At present, there are two and a half rooms and a laboratory available for a school television staff of twelve. The



Each TV teacher must have a small room for himself to study and experiment laboratory functions as an office for three science instructors, who conduct their conferences and prepare their lessons in a welter of construction noises, fumes from chemical experiments, and loud film commentaries. The situation deteriorates with an increase in staff and there is no place to study or think.

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[1] For details of studio facilities refer to Appendix VIII.

At least three additional rooms could be assigned to the use of Television instructors. The rooms might be assigned in the following manner:

One room shared between Physics and Chemistry instructors.

One for General Science and Mathematics instructors.

One for General Programme and Social Studies instructors.

Each office should have a telephone and a television set. A television set in the room would permit viewing lessons without too much disruption of work and over-crowding in the rooms having television sets. Each office could also accommodate subject libraries. The laboratory would be used exclusively for working on experiments and as a workshop for construction of necessary apparatus and models.

Arrangements for viewing films for school television should be separate from evening programmes. School television relies quite heavily on films, for inserts in lessons, and for ideas on experiments. A separate room for viewing is necessary for producer and teacher to pre-view films, and for writing and rehearsing film commentaries.

In addition, one room should be available for rehearsals of television lessons. The rehearsal room should be furnished with tables and chairs, a long display table for science experiments, a blackboard, and a caption stand. A film projector in the rehearsal room would serve better to integrate film in the preparation of the lessons.

Dry runs (rehearsals without cameras) are essential for timing, preparation and checking the performance of experiments, and checking the time taken in setting up the experiment to see whether the experiment will perform at the scheduled time and in the sequence required. Full dry runs would help to work out these details, and save studio time. Rehearsals would clarify work to be performed by the laboratory assistant, and any special work that may be necessary for the lesson. Rehearsals also help the teacher in developing clarity, and giving flow to his words and ideas. Though most lessons are scripted, no scripts are used when recording, and the rehearsals help in memorization. Trouble spots can be checked and adjustments made without being rushed or suffering the tension which prevails in the studio. Above all, fully prepared and rehearsed lessons give confidence to both teacher and producer. Their familiarity with the subject prepares them for any unforeseen emergencies which may arise during recording. Similarly, the English and General Programme lessons are and will be in the form of plays, and will have demonstrations and interviews which will need to be blocked, timed, and checked for pronunciation and other aspects of presentation. Studio assistants will have to be taught to point on the captions, learn to animate captions, manipulate puppets, handle models, etc. All this requires co-ordination and full dry rehearsals would not only save studio time but make for smoother production.

### Staff

The engineering and general production staff is common to both units, and the present engineering staff is capable of handling an increased load of productions. It is necessary to point out that the present practice of employing engineers for camera work is uneconomical and wasteful of manpower. Cameras could well be operated by trained general production staff. It's a healthy sign that gradually professional cameramen trained at the Film Institute at Poona are being employed. It has been observed that though the production crews share their time and responsibility for both the services, "the priority of interest in the general service has thrown the balance of concern and attention, and in some instances prestige to general service and away from school television."[1]

It is not suggested that crew and general production staff be hired specially for school television, but that school television need not resort to short-cut arrangements because of non-assignment of staff for school television. It may, however be mentioned that the long-term planning involved in the production of school television lessons and the routineness and standard formats of some series needs the assignment of the same production crew for the same series. This will help to save time in the studio and make production work easier.

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[1] Kenneth A, Christiansen : "*Educational Television in India, Recommendations and Observations*, 1966, p. 2.

Kenneth Christiansen has recommended the appointment of a Chief Producer for school television. School television has grown to such magnitude that it requires constant high-level administration, co-ordination, and attention. The Director of Television as chief administrator is too busy and can give only his divided attention to school television.

The qualifications of the Chief Producer : He should be :

1. Familiar with project goals, purposes and history.

2. Knowledgeable educator familiar with school system (curriculum and administrative patterns).

3. An experienced broadcaster—with record of training in area of television production, utilization in education.

4. Familiar with AIR TV Center producers and facilities.

Functions and responsibilities of the Chief Producer :

1. Responsible to the Director of Television for co-ordination and administering details of the school service including liaison with the office of Directorate in direct manner *and through* liaison personnel of Directorate (zonal inspectors, school inspector for television).

2. He serves as executive producer for all school programmes . . . through him all matters pertaining to television production and programme development are expediated. Therefore, he functions in executive as well as advisory capacity in production and transmission.

3. Under his supervision the television newsletter would be prepared, edited and published.

4. He would be responsible for guide sheets and check sheets, editing and publication and have liaison responsibility for distribution to schools.

5. The Chief Producer would convene weekly or at a minimum bi-weekly evaluation sessions of programmes produced. This would include producers, studio personnel (floor manager,

cameramen) VTR section representation to report on production problems that affect recording and VTR playback, support personnel representation (artiste, film service).

The purpose of these meetings would be to place all production under constructive analysis with a view to sophistication in production (to provide better dress or look to production and most important to benefit the whole production team in matters that improve learning. The question must be raised in terms of not of only how a programme looks on the air but also how it contributes to the learning experiences in classroom. (Therefore, the Chief Producer as an educator-cum-broadcaster is the appropriate person to convene such sessions.)

These sessions should be kept to a minimum of fifty minutes:

1. Twenty minutes for replay of programme.
2. Five minutes presentation by producer on production concept.
3. Five minutes by teacher on content aims and purposes.
4. Twenty minutes evaluation by group.

6. He will be available for consultation and advice to various planning committees established and continuing committees as well as *ad hoc* committees that may be appointed as the needs develop. This responsibility should hold for in-service programmes, special broadcasts as well as regular school schedule.

Suffice it is to say that this post will be a crucial factor in the entire enterprise and his knowledge of the medium, his vision as an educator and his creative interest will make it possible through his office to achieve the objectives of instructional project.[1]

Thus far, the policy has been to employ school television producers with a background in education and with some teaching and radio/television training and experience. The Television Center, in collaboration with the Department of Education, has also encouraged and provided television teachers with training in production both at home and abroad. This trend of teacher-producer is commendable and hopefully will continue as a constituent structure of school television.

Past experience has shown that on the average a producer can manage three to four productions a week. Television instructor can plan and present, at the most, two to three lessons per week. On the basis of past experience the following additional staff is recommended : Two producers, one for Mathematics, and one for General Programme and Hindi. The Science series can continue to be handled by the present staff of producers, who have experience in producing lessons in science. This will ensure continuity in the series.

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[1] Kenneth A., Christiansen : *Educational Television in India, Recommendations and Observations*, 1966, pp. 3-5.

*Job responsibilities* : Planning, rehearsing and producing television lessons. For planning the producer would be required to attend subject committee meetings to develop an awareness of the subject and series as a whole. He would participate in evaluation of programmes in subject committee meetings and staff meetings held by the Chief Producer.

### Script and Production Conferences

Plan and discuss the initial draft with the teachers; check the final script for content clarify and visualization. Hold production conferences to discuss sets, special visuals, models with the artist, order material, films, special apparatus, check crew requirements, work out assignments for studio assistants and laboratory assistant. Draw up the rehearsal schedule. The present system, in which the teacher is responsible for collecting materials, pictures, films, captions, apparatus, slides and models for the lesson, is unrealistic. Ordering and collecting materials should be the responsibility of the producer, leaving the teacher more time for study, script writing, and lesson preparation. The producer would be in charge of directing the film shooting for his production. He is expected to visit schools to evaluate the effectiveness of the lessons and response to production techniques.

### Television Teachers

For mathematics, for Hindi, and for general programmes, auditions should be held to select television teachers. The circular should contain the following information : date of audition, subject and topic, qualification requirements, expectations and criteria for selection. Teachers should be expected to prepare a ten-minute lesson except on suggested topics.

The panel of judges for the audition should be composed of the Director of Television or the school television programme executive of All India Radio, the Chief Producer, the producer in charge of the series, representatives of the Department of Education, usually the liaison officer and at least one subject expert should also be included.

The following guidelines are suggested for selecting a television teacher:

1. Personal qualities:
   - (*a*) Sincerity.
   - (*b*) Enthusiasm.
   - (*c*) Naturalness.
   - (*d*) Willingness to work.
   - (*e*) Flexibility.
   - (*f*) Resourcefulness.
   - (*g*) Intelligence.
2. Professional skills:
   - (*a*) Understanding.
   - (*b*) Ability to do necessary research.
3. Communication skills:
   - (*a*) Ability to speak easily and interestingly.
   - (*b*) Ability to present ideas in a logical order.
   - (*c*) Ability to manipulate objects.[1]

The auditions should be conducted in the studio before live cameras, to judge ease and adaptability in presentation. Selected teachers should be given a two-week orientation course in subject and television techniques.

*Job responsibilities*: Planning, preparing and presenting television lessons. Preparing guidance notes for class teachers. Working on finalizing television syllabus. Visits to the schools to view lessons, and evaluating response of students and teachers to the television lessons.

### Film Cameraman-cum-Photographer

Film needs to be specially shot for fifteen to twenty per cent of the lessons. English lessons require film to explain particular points using particular characters in action both outdoors and indoors ; science lessons require film on industrial processes, for example metal refinery, waterworks, complicated experiments and demonstrations that are time consuming and need special light arrangements. Often film on these processes and experiments is not available through regular agencies. Lessons in all subjects depend heavily on photographs and slides.

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[1] Kathryn D. Kending and Gaither L. Martin, *The ABC's of TV: A Handbook on Instructional and Public Service Programming for Educators. Community Leaders* (San Jose, Calif: The Apartan Bookstore 1957), p. 116.

Qualification : Experience in film, photography and slide making.

Nature of work: Shooting film outdoors and indoors. Photographic, enlarging, and duplicating pictures and illustrations from books.

Two Artists: Qualifications—a background in commercial art and crafts. The artist should be quick, neat, and versatile in his work.

*Job responsibilities* : Graphics and set design.

Each lesson requires on the average twenty to twenty-five captions. The bulk of art work is lettering which is time consuming and requires skill. It is suggested that the hot press be used for lettering. The art department should immediately purchase or make letter type both in English and Hindi and arrange for the importation of necessary tape or ribbon. The use of the hot press would cut the drudgery, save time and skill to illustrations, diagrams, animations, and models. The school television artist may be called upon to design sets for television.

### The Secretaries

Two Secretaries : Qualifications—proficiency in Hindi and English typing.

*Job responsibilities*: The typist would be required to type lesson scripts, guidance notes, circulars, letters, and reports. Each lesson script is usually fifteen to twenty minutes long or about fifteen to twenty-five pages long. There would be on the average six to eight scripts per 'week. A duplicating machine should be made available for making copies of the above-listed material. A reference file should be maintained.

The crew requirements for a school television production are normally engineering staff, which at present includes the technical director, audio man, camera control, video tape recorder in-charge, and cameraman. The general production staff includes the floor manager and two studio assistants who assist in set-up and work on visuals

*Miscellaneous* : The Television Center has a hundred video tapes. It will be necessary to invest in more video tapes as the series are perfected and preserved and new subjects need to be covered. A precise plan for technical requirements should be developed with consideration given to acquiring standardized equipment so that maintenance is easier and spare parts are easily interchangeable and available.

The Television Centre would continue to bear the responsibility and costs of printing and distributing television syllabi, guidance notes, work books and news-letters.

**Staff Training**

A programme to provide continuing systematic training for television teachers, producers, artists, liaison officers and general production staff should be developed. The Chief Producer for school television should be responsible for directing the training of the staff. Staff members who show promise and talent should be sent abroad for advanced training and study and specialization. Opportunities to make use of foreign experts should also be availed of as was done recently, when Mr. Tom Singleton, Head of Training, CETO, London, conducted a short refresher course for the benefit of school TV teachers and producers.

A manual for the class teachers using television should be prepared. This booklet should cover topics discussed during the seminar : Educational television, aims and objectives of the school television project, the class teacher's role, organization of the class for television instruction, teaching methods, evaluation procedures, and the mechanics of operating a television receiver set.

An illustrated brochure should be designed to familiarize television teachers with the studio, television teaching techniques, preparation of television lessons, office regulations, and procedures and policy.

*The Studio* : Description of the studio facilities and equipment, description of the work performed by the production and technical staff.

*Television Teaching Techniques* : Do's and don'ts of performing on camera. Presentation techniques.

*Preparation of Television Lessons* : Some hints on treatment of subject matter and content of a television lesson. Resources and selecting material for a television lesson. Use of audio-visuals. The instructional language of television. Principles of perception.

*Format and Sample Script* : Office regulations, procedures, and policy would have to be stated as they exist at the time.

It is suggested that at the beginning of the academic year or during the summer vacations arrangements may be made with educational institutions to give special orientation courses to selected television teachers in their subject area.

The Television Center can arrange for viewing pre-recorded television lessons, and introducing new teachers to television teaching techniques, and presentation methods.

Visiting specialists should also be invited to give lectures to the staff.

## Preparation for Primary and Middle School Teachers' Seminars

Prior to the beginning of the service, teachers' seminars would have to be arranged to introduce new teachers to the aims and procedures necessary to make full use of the facilities offered by television as was done on the eve of launching STV project in 1961. The seminars should be scheduled at the end of the academic year. Draft syllabi should be prepared for new subjects. The Television Center should prepare pilot lessons so that the teachers can have an idea of what to expect in the series. Tentative time-table schedules for principals should also be prepared and mailed in advance. If a large number of participants is expected to attend the seminars, the study group technique is recommended where participants are divided into small groups, and each group elects a recorder to report the group's views in the plenary session.

The agenda for these seminars should include topics on the following subjects :

*Educational Television* : Information on educational television in other countries; meaning of total instruction, direct integrated instruction, supplementary instruction and enrichment instruction; television as a medium of mass communication and school education; resources, advantages and limitations of the medium.

School television project in Delhi, aims and objectives, history and evaluation results.

*The Class Teacher—his role and responsibility* : Place of the television lesson in relation to classroom teaching, integration with classroom teaching. How to use television lessons, use of supplementary materials, television syllabus, and guidance notes. Preparation of the lesson, important points to watch, techniques of note-taking and viewing. The teacher should encourage participation of the students during the telecast, and note important points and suggested activities for future use; observe student interest, and problems in understanding. After the telecast in the follow-up a few penetrating questions will tell the teacher whether the television lesson has been followed or not. The class teacher can then direct activity, individual and group, around the telecast. A demonstration of preparation and follow-up activities using an actual class should be given during the seminar. The importance and need for preparation and follow-up should be stressed.

*Curriculum* : The tentative syllabus should be presented for discussion and approval. Suggestions from class teachers should be incorporated in the finalized syllabus. A talk on the importance of following the television syllabus and common problems and remedial measures to keep up with the syllabus should also be given.

*Evaluation* : The purpose and importance of check sheets. How to fill them out. Classroom evaluating and testing techniques. Television tests, their objectives and techniques.

*Mechanics and operation of a television set* : Arrangement of rooms for viewing and maintenance procedures.

Two-day seminars for class teachers of each grade. One-day seminar for principals and zonal inspectors to inform them of the aims of the project, and their responsibilities and role in the school television project.

### Liaison

The administrative set-up for liaison should be such that it insures a continuing flow of information from the schools to the Department of Education and the Television Center, and the flow of information from these departments to the schools. The two departments should have periodic joint meetings to assess the effectiveness of the present machinery of liaison to insure adequate supervision of the utilization of the television lessons in the schools.

An intensive liaison programme, through letters, telephones, television, and personal visits to the schools must be planned at the beginning of the academic year to check and guide the teachers in providing and arranging satisfactory viewing conditions, and to see that the school time-table has provision for television lessons. School visits and observations in the classroom will be useful in checking whether proper preparation and follow-up activities are being carried out and that the teachers have and are using the television syllabus and guidance notes. Information on problems of teachers and principals will provide useful material for inclusion in future seminars. The television staff, producers, and television instructors should also visit schools during this period to see how teachers are reacting to the lessons and to remedy any faults and misunderstandings. This initial period is important to discover attitudes and gain the goodwill and confidence of class teachers which must be acquired for the progress of the project and effective use of television lessons.

Zonal inspectors now make regular visits to the schools in their assigned area or zone and supervision of the utilization of television lessons is included as part of their duties. Reports from zonal inspectors are sent to liaison officers for information and action. These reports and evaluation check sheets from the class teachers are compiled and analysed, for trends in teacher and student opinion regarding television lessons and television teachers, numbers viewing, reason for and record of lessons missed by the class teachers, mistakes made by the television teacher, use of guidance notes, preparation and follow-up by class teachers, evidence and samples of improvement in teaching methods. A fortnightly report based on the above material is issued for circulation to the interested departments.

In addition, a monthly newsletter is mailed to class teachers. The letter offers professional information and provides a means for exchange of teachers' views. The newsletter should be expanded to contain problems, issues, and information connected with school television, to develop discussion on teaching methods, major teaching problems, refer to new teaching techniques, class teachers' experiences and suggestions, summaries of evaluation sheets, research results, answer teachers' questions regarding television lessons, report teacher and student projects, and describe developments in educational television in other parts of the country.

*Administrative use of television* : In addition, a publicity and information campaign through television should be arranged. This may include directives such as meeting dates, where to call for information and maintenance, changes in schedules, repeat transmissions, reminders to class teachers to send evaluation check sheets, school holidays, and monthly tests, and publicity for special programmes, science fairs, and school exhibitions.

Besides regular visits to schools spread throughout the school year, regular zonal meetings should continue to be held to discuss and evaluate the series. Presently, these meetings are arranged after there has been exposure for at least two terms in the months of November and December. The agenda for these meetings must be carefully planned by liaison officers and zonal inspectors and might include topics such as improvement in television syllabi, evaluation of specific television lessons, discussion of teaching techniques, and individual problems. Information regarding these meetings must be sent in advance to class teachers so that they can come prepared to the meeting. This will insure fruitful discussion and time usefully spent.

To conclude, liaison should be maintained through visits to schools, zonal meetings, television publicity campaigns, evaluation check sheets, letters and publications, newsletters, wall sheets of television time-tables, illustrated pamphlets of series, guidance notes and television syllabi.[1]

## Programme for Research

The fortnightly report based on analysis of evaluation check sheets and zonal inspectors' reports, discussed in the section on liaison, will provide a continuing programme of research to evaluate utilization of television in the schools. For more intensive investigation it is suggested that either an autonomous research unit be created by the Department of Education and the Television Center, or the Department of Educational Research and Training be approached to conduct educational television research. It may be necessary to arrange a training programme in mass communication and educational research methods for the personnel assigned.

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[1] The television publications can be packaged by zone and dispatched to selected schools for distribution to schools in the area. This arrangement for distribution of material may be discussed with principals. The present system of mailing material to individual schools is unsatisfactory as the material gets lost, damaged or delayed in transit.

Suggested areas for future study are: the study of techniques needed by students to achieve the best results from television lessons; study of the ways television might further improve the quality of education; study of factors of classroom environment which contribute to improve instruction; testing improvement in understanding and retention of instruction through television; survey and summarize the reactions of teachers, principals and students and discover changing attitudes; effects of audio-visual techniques; structure of television lessons; curriculum and syllabus design.

The research design should be planned in detail for each year so that arrangements for control groups can be made. An overall impact study can be conducted every three years, to assess the organization and operation of the school television project.

### Plan for introducing School Television in Other States

A precise plan for development, of both the technical facilities and programming, with specific objectives and goals to be achieved within a definite period of time, should be drawn up by the Ministry of Education and the Ministry of Information and Broadcasting.

It is suggested that while there is shortage of facilities and trained staff, the following scheme may be considered:

The Delhi Television Center to be the Central source for supplying programme material to other States. The arrangement of programme material would be on the same pattern as the Centre for Educational Television Overseas[1] programme kits. Like CETO, the Delhi Television Center would prepare scripts, visual materials, photographs, captions, and film, and mail the full programme kit to the other TV Centers. The local station would then translate and adapt the material to their own particular needs. This arrangement would be economical as these programmes would have been perfected and tested in Delhi. Minimum studio facilities and time would be required to put these programmes together for transmission. Later, when the "local" station has enough trained staff it can originate programmes that fulfil local needs and prepare programme kits for other States. A Central library for video tapes, kinescopes, programme kits and supplementary material should be established in Delhi. International programme exchange and exchange of research information could be organized through the Asian Broadcasting Union and the European Broadcasting Union.

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[1] The Centre for Educational Television Overseas (CETO) in London, was established in 1962 to help advance the education of children and adults in developing countries by means of television. CETO is a non-commercial organization. The greater part of its expenses has been met by grants from the Nuffield Foundation, the Ford Foundation, the British Government, and the Independent Television Companies in the United Kingdom. The British Broadcasting Corporation has provided technical and other facilities, especially the use of its studios and programme material. Other organizations have also made grants, frequently for the execution of specific projects. The Centre has close relations with the British Council. *CETO News 8*, *op. cit.*, September, 1965, p. 1.

The experience of the Delhi Television Centre would be applied in planning and starting each new service with a national advisory committee set up to advise on the details of operation, administration, and budget; sub-committees for planning curriculum, content of programmes, distribution of programmes, publications and research would be appointed locally. The national advisory committee should have as members, a co-ordinating officer, representing the liaison officers, a head of research department, educationists and directors of television centres and State directors of education.

It is suggested that there be increasing participation and initiative by the Ministry of Education in encouraging the use of television to better serve the educational needs of the country. Any expansion policy for school television should be jointly planned by the educators and broadcasters. Television programmes jointly planned and executed by the teacher and broadcaster will have a definite contribution to make to meet the educational needs of the growing school population. The closest possible relationship between television and the class teacher is stressed in all stages of planning as the responsibility of co-ordinating and utilizing the service rests with him. Thus the role of the broadcasting organization should not necessarily be limited to providing production facilities, but it should actively participate in the planning and execution of educational programmes of the country.

# Conclusions

Television holds fascinating opportunities for the world of education. In this era of constant change, it has opened a new vista of a instructional media to alleviate the difficult problems of critical shortage of school facilities for the constantly growing school-population, shortage of 'qualified teachers and well equipped laboratories, and the mounting costs of education.

Television, as an instructional tool, is being used in a variety of ways : for direct teaching, for supplementation or enrichment in schools and colleges, for eradicating illiteracy, for adult education, Teachers' Training etc. At the school level different countries are using this powerful medium in different ways to solve their immediate problems. For instance, in Italy to meet the lack of middle school facilities, specially in rural areas, Radio Italiana in collaboration with the Ministry of Education launched TELESCUOLA—a project to impart complete course of instruction normally given in middle schools. The French Educators are utilizing television as part of a vast effort to modernise teaching techniques, to assign to teachers new functions, and to stimulate the active participation of the students in the learning process. In the view of these educators, audio-visual techniques should serve to improve school programmes which are overful, and should replace methods of teaching which in their excessive emphasis on details make inordinate demands on the pupils' memory. The British educational system is well known for its decentralization, and the freedom of the teachers from official direction on questions relating to curricula and methods of teaching. So the principal aim is to present imaginative programmes containing a wealth of material and range of experience which is beyond the capacity of individual teachers to provide.

The aim is to arouse the child's curiosity, to stimulate thought and to provide aesthetic experience which the teacher may use as the starting point, the culmination or extension of his own work. But recently some direct teaching series have also been attempted in some selected subjects, because of the dearth of qualified teachers. "In music more direct instruction has for some time been attempted, because of the shortage of trained subject teachers. Recently teachers have particularly welcomed a directly instructional contribution from Broadcasting in the field of Science."[1]

In the United States of America the emphasis is on making the best use of this new powerful tool, to compensate for certain deficiencies in the school system *i.e.*, to match the upward spiral of enrolment figures, deficit of qualified teachers and building space. Total instruction is provided almost entirely by the studio-teacher. A student in a small place is able to take Physics and Chemistry by TV and thus qualify for enrolment in college. These courses are not offered at his school because of the lack of laboratory facilities and trained teachers.

In India, during the past fifteen years, significant strides have been made towards the goal of providing schooling to all children until they complete the age of 14 years. But even during the Fourth Plan, it is expected to increase the enrolment from 78·5 to 92·2 per cent in the age-group 6-11 ; from 32·2 to 47·4 per cent in the age-group 11-14 ; from 17·8 to 22·1 per cent in the age-group 14-17 ; and from 1·9 to 2·4 per cent in the age-group 17-22. Some basic problems faced are shortage of school buildings, qualified trained teachers, research facilities, teaching material and text-books.

Though an effort is being made to solve these problems, perhaps one resource that could be used more fully in education is radio and television. The Ford Foundation Mass Communication Study Team, whose leader was Dr. William Schramm, suggested :

"Fuller advantage should be taken of the mass media, especially radio and instructional films, to speed and extend the education process in schools and colleges and for adult population. Radio particularly can be used to multiply the effectiveness of teaching resources, to extend the range of good teaching, to conduct in-service training of teachers."[1]

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[1] BBC 1965 Hand Book, p. 71.

The report also recommended broader use of the Delhi Television Project. "The experimental television project at Delhi should be developed and improved to become a model for the constructive use of the television in India. It should be used to set standards for the later development of television and to serve as a training ground for use of television in accelerating national development."[2]

In India whenever we think of using radio-television in education, we normally think in terms of enrichment programmes only. The Delhi ETV project has established that these powerful media need not be used to replace the teacher ; but can certainly be used for direct sequential instruction to compensate the dearth of qualified and trained teachers, and to provide equal educational opportunities to the students to benefit by the best available teaching talent in the region. There is need for bold experiments in other areas too. For instance a project can be launched to eradicate illiteracy. Past experience has amply revealed that the adults do not like to attend to a literacy class, but if attempts are made to teach him through radio-TV through programmes woven with information on problems related with his daily life. He may welcome it, because when he attends a radio-TV programme session, he feels a part of the audience and not a classroom. Radio could be utilized for creating a climate of learning. In fact the whole problem of adult education in developing countries is the problem of conveying right knowledge to the adult, of changing his outlook, and of persuading him to think and act rightly. And radio is the most suitable medium to achieve these objectives. Television can be successfully utilized for teaching actual alphabets too, as the movements of the fingers while writing or drawing can be effectively demonstrated. At a later stage special TV courses could be devised to avoid the relapse into illiteracy.

Yet another important field ripe for the use of radio-TV is to supplement education through postal lessons. The system of

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1. Report of the Mass Communication Study Team : Ministry of Information and Broadcasting, Government of India, 1963, p. 16.

2. *Ibid.*, p. 26.

correspondence courses constitutes a very significant element in the educational development plan in India. Looking to the inadequate resources available for educational expansion, without resorting to this system, it would be practically impossible to meet the growing demand and need of education in the country. The Directorate of Correspondence Courses of the Delhi University is the pioneer institution in the field. Teaching is a two-direction process, a sharing process, the reaction and interaction of minds. In a correspondence study programme, the student misses the personal magnetism of the teacher who is miles away from him. Secondly, it is not possible to teach certain disciplines that are strictly oral : recitation, reading, diction, singing, music etc. Here particularly radio could be used as an effective aid. Recently All India Radio has launched *the University of the Air*—a project to supplement and to reinforce the efforts of the correspondence course department. This is a healthy and commendable trend. There is tremendous scope to provide even complete education at all levels through radio and television, as is being done in countries like Italy.

Education is the most important single factor in achieving rapid ecomomic development and for creating a democratic social order. The mass media of education, specially radio and television, are powerful tools to provide qualitative instruction, and for quantitative expansion of education at all levels. It is for the educationists and broadcasters to join hands and hearts to exploit them fully with courage, imagination and perseverance.

# APPENDIX I

## SOCIAL EDUCATION TELEVISION

In 1955, at the International Industries Fair several radio and electronic companies exhibited and operated closed circuit and open circuit television. Programmes were put out by All India Radio. Visitors to the exhibition showed keen interest in this new entertainment medium.

At the end of the Fair, Phillips, finding it too expensive to move the equipment, sold the equipment at a nominal price to All India Radio.

All India Radio's research section engineers started experimenting with and studying the equipment, making themselves thoroughly familiar with the electronics.

In 1958, All India Radio arranged the loan of a film chain, two vidicon cameras, two image orthicon cameras, a microwave link and some additional equipment from the United States Information Services. The United Nations Educational, Scientific and Cultural Organisation also contributed seventy twentyone inch television receiver sets and a portable generator.

An office measuring eight hundred square feet located on the fifth floor of Akashvani Bhavan was converted into a studio and equipped. Twenty-one receiver sets were installed in community centres of adult education and social welfare.

On September 15, 1959, All India Radio inaugurated its television service in Delhi on an experimental basis. Programmes were transmitted for an hour from 7.00 p.m. to 8.00 p.m.

Programmes included talks, interviews and discussions, documentary films from films division and foreign embassies, variety, quiz shows, drama, dance and light classical music. A van equipped through the aid of the United States Information Service covered outside broadcasts (remotes) on special events, Republic Day parades, State visits, etc.

A special project was initiated under the UNESCO contract to study the effectiveness of special educational television programmes on organized groups of viewers. Twenty programmes were telecast over a period of six months on the following topics:

Traffic and Road Sense.
Community Health.
Adulteration in Food.
Good Manners.
Encroachment of Public Property.

Teleclubs were organized with a membership of twenty-five regular viewers. The teleclub organizer led discussions after the programmes and reported back to the Television Centre. Since television was a novelty, viewers flocked to the teleclubs and often there were more than a hundred viewers around a set. Evaluation of the impact of these programmes was conducted by the Indian Adult Education Association and the National Fundamental Education Center of the Ministry of Education. A favourable summary of the report was published by UNESCO. To reinforce the impact, programmes on the same subjects have been repeated.

In giving the summary of main findings, interpretation and conclusions, the report says : "The main purpose of the inquiry was to assess the usefulness of television for social education. This was to be gauged by measuring the shifts in information, attitudes and behaviour brought about in the 418 members of the 20 Tele-clubs in the sample, as a result of viewing 20 special telecasts on citizenship and participating in post-viewing discussions.

The data showed that there were in fact statistically significant shifts in these three respects. The members of the experimental group increased their mean scores on information, attitude, and behaviour questions to a very considerable extent. The persons in the control group also increased their mean scores on each of the three types of questions, but the increases were small as compared with those of the experimental group. While the gains in mean score of the control group could be explained by chance, similar gains for the experimental group could not be so explained. The two groups differed significantly.

The largest gain was made on information questions. While the gain in mean score was 17·6 per cent on attitude questions and 23·2 per cent on behaviour questions, it was 85·2 per cent on information questions. This was partly due to the fact that while the experimental group started with a high level on attitude and behaviour its baseline level on information was comparatively much lower. However, the fact remains that, in comparison with changes in attitudes and behaviour, the special telecasts were much more successful in bringing about shifts in information.

Most of the Tele-club members were already fairly well informed on the nine selected questions and practically all of those who were not soon learned. It is of course very likely that if the telecasts had been viewed by persons who were less well informed and less accustomed to the attitudes and behaviour that the nine questions were designed to promote, the changes brought about would have been much more marked.

The large majority of the members who made gains in learning as a result of viewing the telecasts and participating in post-viewing discussions retained the gain for at least 12 weeks till the terminal survey was conducted. The number of members who retained the gain was significantly larger than the number of those who made the gain after viewing the telecast but lost it by the time of the terminal survey.

This showed that the retention of the impact over the 12 week period was not illusory or attributable to chance sampling error, but really existed".[1]

Another special project was started during the national emergency in 1963-64, a series on First Aid was telecast to the teleclubs. At the end of the series Red Cross conducted tests and conferred certificates upon successful members.

With the introduction of school television in 1961, teleclubs were formed in schools and the number of teleclubs increased to one hundred and eighty-two with a viewing membership of twenty thousand people. The organizer of the teleclub is usually a school teacher who is paid a small honorarium by the Delhi Education Directorate. The organizer reports by mail the questions arising from discussions. The questions from teleclubs are answered over television in a ten-minute programme and also by mail. A teleclub news-letter, "Patrika", was published fortnightly for three years, 1961-1964, but had to be discontinued due to lack of funds. The staff of the Television Center also visits teleclubs regularly and organizes meetings to discuss problems of organization and programme needs. Further systematic evaluation has been planned to check the impact of programmes on viewers.

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[1] Social Education through Television : UNESCO Report No. 38, p.35.

Though teleclubs increased with the availability of television receiver sets in schools, the days of programmes had to be reduced to twice per week in 1961-63 because studio facilities were being utilized by the school television unit. During 1964-65 with more experience, double shift working hours, better utilization of studio time, increased staff, programmes were extended to three days per week, the duration remaining one hour per day.[1]

On August 15, 1966, a daily service for one hour per day was started. This was made possible with the new studio facilities located in the All India Radio auditorium. This studio was fully equipped with the West German Government's aid. Restrictions on importation of television sets in India were lifted and nearly three thousand sets made available to the public.

Programme schedules for social education are drawn up on a quarter system and are essentially educational, informative and entertaining. Most of the talent is from All India Radio, National School of Drama and amateur dramatic companies active in Delhi. At present forty-five per cent of the programming is film. The remaining programmes are live or recorded in the studio.

Delhi viewers have now become fairly sophisticated and expect high quality programming from television. Television in Delhi already feels the lack of talent in writers, actors, and producers.

All India Radio arranged a training programme for producers under the direction of Mr. Humphrey Barron (Producer-Director on the staff of the British Broadcasting Service). At the end of

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1. *Educational Television in Developing Countries, op. cit., p. 33.*

the two-month training period, out of eleven trainees, only three producers remained on the staff of the Television Center. The rest of the trained producers had either been transferred to radio or been given administrative positions. Three senior members of the staff were sent for training to the Thomson Foundation in Glasgow for a period of eight weeks. One person went to Japan for a three-month period and received intensive training at the Japan Broadcasting Center also known as Nippon Hoso Kyoka (NHK).

During the period 1959–66, Television Center had five directorial changes. All five directors had received advanced instruction and training abroad. The short terms spent by each director in office had both advantages and disadvantages. The variety of experience each director brought enriched programme policy but no consistent programme policy could be evolved. Other organizational repercussions resulted with these changes.

Humphrey Barron in his final report to the Director of Television Center pointed out the need for consistent, systematic training. None of the staff members who have received training abroad have offered on their return to give lectures or an account of their experiences for the benefit of the organization.

Operating on a shoestring budget, with cramped and ill-planned studios, and an assortment of equipment from all parts of the world, television continues to make its impact and gain recognition in Delhi.

**Staff**

The organization of the staff of the evening programme unit is illustrated below :

Director of Television

Assistant Station Directors (2)

Chief Engineer
Assistant Station Engineers (4)
Assistant Engineers (14)
Shift Assistants (20)

Program Executives
Staff (1) Production (2)

Program Planning (1)

Transmission Executives (4)

Film (2)
Film Officers (2)
Film Cameramen (3)
Film Editor (1)
Photographer (1)

Script Writer (1)
Announcers (4)
News Reader (1)

Artists (3)
Set Designer (1)
Assistants (2)
Floor Managers (4)
Studio Assistants (6)

Producers (5)
Assistant Producers (3)

Other institutions that are in the planning stage and have experimented with television are : The Department of Audio-Visual Education. This institute produced a series on dental surgery fora Medical College. National School of Drama plans to have a television training programme for actors and producers. The Ministry of Information and Broadcasting has set up an Institute of Mass Communications that offers courses in Journalism and Communications. A two-year Diploma Course is planned with practical training at the Television Center.

All India Radio plans to set up television stations in Bombay, Calcutta, Kanpur and Madras within the next five years.

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# APPENDIX II

## WORKSHOPS' SCHEDULE

*Programme of the Series of Workshops Of the Subject-Teachers and School Principals.*

| | *Duration* | *Dates* |
|---|---|---|
| Principals' Meet | 1 day | 12-6-61 |
| Physics Group | 5 days | 13-6-61 to 17-6-61 |
| Chemistry Group | 5 days | 19-6-61 to 23-6-61 |
| English Group | 3 days | 26-6-61 to 28-6-61 |
| Hindi Group | 3 days | 29-6-61 to 1-7-61 |

**Topics Covered**

1. Television in Education : Potentialities and limitations.
2. Objectives of the Delhi School TV Project.
3. The TV Curriculum.
4. The Team Approach :
    - (*i*) Classroom teacher cum studio teacher partnership.
    - (*ii*) Coordination between the studio and classroom.
    - (*iii*) Collaboration between Education and Broadcasting Departments.
    - (*iv*) Production Team : TV Teacher, Subject Supervisor, Visual Supervisor and Producer.
5. Selection of TV topics : TV Lesson—Content and presentation.

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    - (*iv*) Production Team : TV Teacher, Subject Supervisor, Visual Supervisor and Producer.
5. Selection of TV topics : TV Lesson – Content and presentation.

6. Classroom Integration
    - (*i*) Viewing provision in the school time-table.
    - (*ii*) Preparation and follow up of TV lessons.
    - (*iii*) Planning and execution of weekly distribution of syllabus.
7. Audio-visual Materials.
    - (*i*) The purpose of audio-visual meterials.
    - (*ii*) Audio-visual material suitable to TV.
    - (*iii*) Audio-visual material for classroom use.
8. Evaluating the TV lessons.
9. The mechanics of television set.

### Study Group Technique

In large conferences individual participation becomes almost impossible. To ensure maximum participation from each participant, on the very first day of each workshop, the entire group used to be divided into small study groups not exceeding 20. Each group will then select a recorder. It was left to the groups to decide if the 'recorder' should change everyday to enable more than one member to play this role.

After each lecture or TV lesson, these groups would retire to separate rooms. The 'recorders' would jot down salient points arising out of the discussion ; and then present it to the general group.

The study group technique proved very useful and effective. Each participant felt actively involved in all the activities and in giving final shape to the TV schedules and other decisions taken.

# APPENDIX III

## GUIDANCE SHEET

## *Physics for Class XI*

*Topic* : Dynamo *Teacher* : Vyas Deo
*Date* : 5th October, 1966

### Objective

To make the pupils discover the principle and working of an A.C. dynamo.

### Vocabulary

Flux, E.M.F., Slip rings, Brushes, Commutator, Oscilloscope.

### Previous Knowledge

Pupils have learnt by now about the induced E.M.F. and induced current. They are also familiar with the direction of the induced current as given by the Fleming's right-hand rule.

### Suggestions for Pre-Telecast

Need of a source for a continuous current for our daily needs at house and in industry may be emphasised to the pupils. How to get it ? Certainly it is not possible by cells. Could there be some other devise ? Let the pupils think—leading thereby to the topic of the day.

### Outline of the Lesson

1. Need of a continuous supply of current.

2. Recalling the experiment of the coil and the magnet. Relative motion between the coil and the magnet produces an induced current in a closed coil.
3. Direction of the induced current is determined by the Fleming's right-hand rule.

   Current in a coil, rotating in a magnetic field, is of alternating nature.
4. Demonstrating the rate of change in flux in a rotating coil.

   E.M.F. will be maximum when the plane of the coil is parallel to the lines of force and it will be minimum when it is perpendicular to them.
5. Setting up a coil rotating in a magnetic field between two magnets—need of slip rings to take the current out in the outer circuit.
6. Demonstration of the alternating nature of the current, so obtained, by means of the galvanometer as well as oscilloscope.
7. Need of the Direct Current too is emphasised. But this coil always gives alternating current. What device should be used to get the direct current out of it ?

**Assignment**

Problem is posed at the end of the lesson :

"How can we get Direct Current ?"

**Suggestions for Follow-up**

1. The problem posed at the close of the lesson may please be discussed with the pupils, leading to the provision of the Split-Rings to take D.C. out of this dynamo.
2. If the model of the A.C. and D.C. dynamos are available, they may please be shown to the pupils.
3. Subsequently, the children may please be encouraged to prepare the model of the A.C. dynamo as suggested in the lesson and they be led to develop it further into a D.C. model.

## *Chemistry for Class XI*

*Lesson No.* : 14 *Topic* : Steel
*Date of Telecast* : 24th September, 1966 *Television Teacher* : R. R. Sharma

**Text References**

1. General Chemistry by N. Glinka.
2. Inorganic Chemistry by Partington.
3. Modern Chemistry by Dull, Metcalfe and Williams.

**Objective**

To make the pupils understand the difference between Cast Iron, Wrought Iron and Steel as well as open Hearth process for the manufacture of Steel.

**Vocabulary**

Charge, Flux, Acidic Oxide, Scrap Steel, Producer Gas, Spigelcisen, Slag.

**Suggestions for Pre-Telecast Activity**

The teacher may explain the words given in vocabulary. He may further explain the principle involved in the manufacture of Steel from Cast Iron by asking certain questions to the students.

**Outline of Telecast Lesson**

1. Introduction :
   Forms of iron *i.e.* Cast Iron, Wrought Iron and Steel; and the difference in three forms.
2. Method of manufacturing Steel from Cast Iron.
   - (*a*) Preparation of charge (Cast Iron+Scrap Steel+Hematite).
   - (*b*) Description of open hearth furnace.
   - (*c*) Explanation of fire brick checkers works for the regeneration of heat.
   - (*d*) Addition of Mn-C alloy at the end and its function.
   - (*e*) Removal of Steel from the furnace and preparation of ingots.
3. Position of steel industries in India.

4. Production and consumption of Steel in India per year.
5. Recapitulation of whole unit with the help of diagrams.

**Suggestions for Follow-up**

The teacher may revise the whole unit with the active cooperation of students.

**Objective Test Items**

Complete the statements by underlining the proper word or words :—

(*a*) The Basic Charge of the open hearth furnace consists of (*i*) Coke, lime-stone and iron, (*ii*) Lime-stone, scrap and molten iron, (*iii*) Manganese, carbon and silicon.

(*b*) Most steel is now made in (*i*) Electric furnaces, (*ii*) Bessemer convertors (*iii*) Open hearth furnaces.

(*c*) The CaO produced from the decomposition of limestone in the open hearth furnace is useful (*i*) in making steel more malleable, (*ii*) in extracting impurities from molten metal and (*iii*) as a fuel.

(*d*) The first solid form in which most steel is shaped after being poured from a steel furnace is called (*i*) ingot, (*ii*) a charge (*iii*) a bar, (*iv*) a billet.

(*e*) Scrap is important because (*i*) Its use helps to conserve Coal, Iron ore, Lime-stone, (*ii*) It is readily available in quantity.

**Supplementary Text References**

1. Chemistry in Action by Rawlins.
2. Using Chemistry by Lanford.

## *General Science for Class VII*

*Lesson No.* : 12 *Topic* : Moisture in air.

*Date of Telecast* : 6th October, 1966 *Television Teacher* : S. K. Verma.

**Aim of the Lesson**

To enable the students to understand the presence of moisture in air and its condensation in different forms.

## Pre-Telecast Activities

It is suggested that students may be acquainted with the knowledge that water of rivers, canals, ponds changes into vapours. It means that air contains moisture. The students may be reminded of dew, mist, clouds, rain etc. How are they formed ? This question may be posed before the students. The students being unable to reply it, will be anxious to view it on television.

## Summary of the Lesson

1. The lesson starts with the idea that air contains moisture and these vapours condense on the cold walls of a beaker.
2. The idea of unsaturated and saturated air is given with the help of barometric tube containing mercury.
3. A certain amount of water vapours contained in a certain volume of air is sufficient to saturate it if temperature falls. This idea is given with a very simple experiment.
4. Formation of dew is shown by a very simple experiment.
5. The idea of fog is made clear by a film and formation of fog is shown by liquid air.
6. Clouds in a bottle. This experiment illustrates the formation of clouds.
7. When the temperature of air falls immediately to 0°C, frost is formed.
8. How are rain drops formed ? This is explained by an experiment.
9. The formation of snow at high altitudes is made clear by a film.

## Follow-up

The students may be asked to answer the objective type question given at the end of the chapter in the text.

## References

1. Text of General Science for Class VII.
2. Physics by Basu and Chatterjee.
3. Film on Ice—N.I.A.V.E.

## *English*

*Class* : VIII
*TV Lesson* : No. 13
*Date of Telecast* : 11th October, 1966
*Time of Telecast* : 9.15 A.M. & 3.15 P.M.

### 1. Pre-Telecast activity

(*i*) The classroom teacher should introduce the vocabulary given below.

(*ii*) The classroom teacher should tell the pupils what the TV lesson is about.

### 2. TV Lesson No. 13

Structures No. 13, 15, 23.

Vocabulary used—(to) revise.

### Content of TV Lesson

This lesson will revise TV Lessons No. 9, 10 and 12. For content of these lessons please refer to the Teachers Notes of these lessons.

### Participation

The classroom teacher should help the pupils to repeat and to answer when the studio teacher asks them to do so.

### Classroom Work

1. Teaching of vocabulary items from NEC Lesson No. 11.
2. Reading of NEC Lesson No. 11.
3. Teaching of structure No. 24a, b & c.

(*a*) now/then.

"I am working now."

She said (that) she was working then.

(*b*) here/there.

"I am here."

He said (that) she was there.

(*c*) this/that.
"I like this book."
She said (that) she liked that book.

4. Teaching of structure No. 25a & b.
   (*a*) yesterday/the day before.
   "I was working yesterday."
   He said (that) he was working the day before.
   (*b*) tomorrow/the next day.
   "I will come tomorrow."
   He said (that) he would come the next day.
5. Teaching of vocabulary items from NEC Lesson No. 12.
6. Reading of NEC Lesson No. 12.

### TV Period

1. Pre-telecast activity.
2. TV Lesson No. 13.
   Structures No. 13, 15 and 23 (revision).
3. Follow-up.

### Suggestions

For revision use the methods suggested in the introduction and follow-up sections of structures No. 13, 15 and 23 (TV Lessons No. 9, 10 and 12). New examples of these structures can be used.

# APPENDIX IV

## EVALUATION CHECK SHEET

Name of School ______________________________

Address ______________________________

Class _______________ Date of Lesson ____________

T.V. School No. ______________________________

T.V. Teacher ______________________________

Title of Lesson ______________________________

**1. Your judgment about today's Lesson :**

(i) **Overall** : excellent ☐ fairly good ☐

average ☐ below average ☐ poor ☐

If below average or poor, in what respect ? ____________

________________________________________

(ii) **Its pace** : much too fast ☐ a little too fast ☐

adequate ☐ too slow ☐

(iii) **Its relation to standard of class :**

much too advanced ☐ a little too advanced ☐

about right ☐ below ☐

If too advanced or below standard : which portions ?_____

2. What **mistakes,** if any, did you notice ?_____

3. The **guidance notes** were

very helpful ☐ of some help ☐ of little or no help ☐

How could they have been improved ?_____

4. Do you have any comments on the **visual aids** used ?_____

5. **What changes, if any, would you suggest** in the treatment of today's topic ?_____

6. Which portions, if any, of today's lesson did not lend themselves to presentation on TV—and why ?_____

7. What was the **reaction of your students** ?

Mostly attentive ☐ only partly attentive ☐ mostly inattentive ☐

If only partly or not attentive, why ?_____

.8 What, if any, difficulties with the **vocabulary** did you notice ?______

__________________________________________

__________________________________________

9. **For science lessons** only :

(i) About what proportion of the students had **difficulties with the English** of the lesson ?

Over 50% ☐ 30% to 50% ☐

10% to 30% ☐ below 10% ☐ Nil ☐

(ii) What experiments, if any, were not well understood by the average student and why ?______

__________________________________________

(iii) Which of the experiments, if any, did you find not worthwhile and why ?______

__________________________________________

(iv) Which parts of the lesson could you not have done easily in your own school and why ?______

__________________________________________

10. Do you have any **general comments or suggestions** ? (including suggestions about other or additional experiments or visual or about changing the content of the lesson or anything else)______

__________________________________________

11. Lesson was received : fully ☐ partly ☐

not at all ☐ If partly , picture not clear ☐

sound not clear ☐ partial power failure ☐

If not at all : power failure ☐ Teacher absent ☐

School Holiday ☐ Others

Please specify ______________________________

Why ?

Set not operating/ Since when ?
Aerial not working What was done about it ?

*Teacher's Signature*

*A* : for August, 1966.

Number of lessons telecast and number of evaluation check sheets received for each subject (class-wise) :

# APPENDIX V

## MONTHLY EVALUATION REPORT BASED ON CHECK SHEETS

**English :**

1. For flash backs it could have been much better if all the properties were visible as they were in the lesson itself. (English VII—8th August, 1966.)
2. There is scope for improvement in the lesson (English VII—1st August 1966.)
3. Teaching of 'Always' could have been clearer. Method of drilling was different towards the end (English VII—1st August, 1966.)
4. Pace too fast (English VIII—7th August, 1966).
5. More examples are needed (English VIII—9th August, 1966).
6. TV lesson going ahead of the syllabus (English VIII—23rd August, 1966).

**General Science :**

1. Pace too fast (Reptiles—13th August, 1966).
2. There was no proper co-ordination with the objects and the captions. They were displayed at a gap (Plant life—27th August, 1966).
3. Need of fertilizers was not explained. Osmosis should not have been taken up at this stage. Lesson was too advance for their standard. Why and how roots absorb soluble material and why there is Osmosis when two solubles of different densities are separated by semi-permeable membrane (Plant food from soil—4th August, 1966) ?

4. Lesson was above the class level and not developed properly (Photosynthesis—11th August, 1966).
5. TV teacher seemed nervous—voice not impressive. Lesson was not according to the syllabus (Seed—12th August, 1966).
6. More subject matter could be included (Kitchen garden—26th August, 1966—VIII).

**Physics :**

1. More examples should be given for velocity and speed to differentiate between them (Speed and Velocity—8th August, 1966—IX).
2. Emphasis was not on the concept of Energy. In case of power an example of motor, some engine should have been taken up (Work, Power and Energy—9th August, 1966—X).
3. Lesson contained too much subject matter, presentation of the subject matter can be improved to a great extent. (Transformation of Energy—12th August, 1966—X).
4. More experiments should be included (Magnetic effect of Element—10th August, 1966—XI).

**Chemistry :**

1. Pace of the lesson was too fast. Zinc and $H_2SO_4$ reaction needed more explanation. Super-saturated solution and crystalization were not defined (Solution—2nd August, 1966—IX).
2. TV teacher should speak slowly and clearly. (Language of Chemistry—16th August, 1966—IX).
3. Reaction of gun powder can also be shown. Lesson was mostly on Nitrogen Cycle, so it was not according to the title of the lesson.

   Lesson went a little out of point when discussing Ammonia and other materials. Teacher spoke too fast (Fixation of Atmospheric Nitrogen—4th August, 1966—X).
4. More stress may be laid on the Chemistry—manufacturing chief properties and uses of chemical fertilizers. Balance may be subjected from Agriculture to Chemistry (Fertilizers—11th August, 1966—X).
5. Lesson contained too much subject matter. Avogadro's number should not have been taken-up (Avogadro's law—25th August, 1966—X).

# APPENDIX VI

## REPORT ON TEACHERS' MEETINGS

### I. General

Ten meetings were arranged for science teachers of the Higher Secondary classes, from 28th November, 1963 to 11th December, 1963. The Physics teachers and Chemistry teachers met in different groups at each centre. Altogether 94 Physics teachers from 79 schools and 87 Chemistry teachers from 72 schools attended the meetings which were utilized to discuss the following main topics :

1. Revision of class-wise syllabus.
2. Criteria for selecting lessons for presentation over television.
3. The television series "Physics in Everyday Life" and "Chemistry in the Service of Mankind".
4. Various aspects of television lessons.
5. General organization of the television programme.
6. Extension of educational television.
7. General suggestions.

### II. Revision of Class-wise Syllabus

A large number of teachers came forward with suggestions in this connection and as was only to be expected some conflicting suggestions were received *e.g.*, some teachers felt that the television lesson on the topic "Measurement and its necessity" was too simple to be taken on television while some others felt that a television lesson on the topic would be worth while as the visual representation would create interest among the students. Such suggestions concerning individual topics would certainly be considered carefully by the syllabus planning committee.

Some defects in the syllabus in use at present were pointed out, *e.g.*,

(*a*) The 9th class syllabus included some difficult topics.

(*b*) The week-wise syllabus at times did not pay attention to the requirements of the class-room teachers.

(*c*) Too many topics were left for the present 11th class.

But what was more important was that the teachers spotlighted many facts which they desired the syllabus planning committee to bear in mind while chalking out the programme for the next year. In this connection it was explained that some of these considerations may have to be set aside while framing the 10th class syllabus for 1964-65 as it would of necessity, have to be linked with the 9th class syllabus of 1962-63 already in use. Their suggestions were as follows :

1. The actual standard of teaching general science in the 8th class is not upto the mark. As a result, the students, for all practical purposes, have to begin afresh in the 9th class. This point should be borne in mind while planning the 9th class syllabus. Difficult topics like the Role of Chemistry in Food, Agriculture and in Textiles and Dyes, should be avoided in the beginning. Side by side the language of the TV lessons in the beginning should be simple and the pace slow. All the difficult technical terms should be explained properly.

2. The whole syllabus should be planned in such a way that the whole of it is covered by the end of November for the 11th class. The usual practice in the schools is to allow the 11th class students sufficient time to revise the whole higher secondary syllabus for all the subjects.

3. No in-class teaching programme should be started in May for the 9th class as the selection of students for the science sections and other general admissions for the 9th class, are finalised only in July.

4. The week-wise syllabus should be planned in such a way that the class-room teachers—

(*a*) get sufficient time to cover the topics allotted to them, including practice time for the students in the case of balancing of equations, numericals etc. ; and (*b*) don't have to remain idle because simple TV lessons are spread over too many days.

5. The week-wise syllabus should take into consideration the related topics which should be taken up together. This is not always so in the present syllabus *e.g.*, in case of 'Language of Chemistry' where the topic is taken up along with a few other topics.

It may be pointed out here that the introduction of TV teaching has necessitated a uniformly standard programme of covering the higher secondary science syllabus in the 9th, 10th and 11th classes. Formerly the four educational Zones and to some extent the individual schools were free to cover the whole syllabus as they saw it fit to do so. Now since they have to conform to one standard term-wise and even week-wise syllabus, they have to change a number of their practices, not to say their ideas. It is here that a consensus of opinion is hard to achieve. Some teachers wanted that the 9th class syllabus should be limited to only elementary topics because they maintain that the 9th class students have not reached the stage when they can grasp the more difficult concepts. On the other hand, some teachers pointed out that unless the 9th class students were guided to go beyond the merely elementary stage, the burden would be too heavy in the 10th and 11th classes. However, they all agreed that the methods of teaching science at the lower levels (*i.e.* 7th and 8th classes) needed drastic improvements. They all enthusiastically welcomed a proposal for science television lessons for the 8th class. An equitable distribution of syllabus in the higher secondary classes would be possible only when the students are properly instructed at the lower levels. Some of the teachers considered it to be a logical corollary of the upgrading of schools to the higher secondary level.

### III. Selecting Lessons for TV

The teachers were critical about the selection of topics for presentation over television. In their opinion too many television lessons were given on certain topics as in the case of "Simple Laboratory Processes". At times topics which were not suitable for TV were allotted to the TV teachers, *e.g.*, Velocity of Light where too much of mathematics is involved. They suggested certain criteria for selecting lessons for television :

(*a*) Lessons involving numericals and too many equations should not be chosen for television.

(*b*) Students are required to perform certain experiments by themselves *e.g.* measurement of focal length, preparation of gases like nitrogen etc. Lessons involving such experiments should not be taken on television.

(*c*) Lessons involving very common apparatus should not be dealt with on television *e.g.* measurement of volume by burette or many of the simple laboratory processes.

(*d*) Lecture-type of lessons should be avoided.

The class-room teachers are unable to deal with many topics for lack of laboratory equipment, lack of time or lack of proper accommodation etc. ; and they feel that it is here that the television teacher can come to their help. A useful television lesson would be one which can clarify concepts with the help of good visual material or can provide novel experience to the students. A television lesson should not only be a good lesson but it should also come at the proper time to be really useful.

It was also suggested that the selection of television lessons should precede the planning of week-wise syllabus so that television lessons are not chosen merely to fulfil a certain quota of television lessons. Some teachers even came forward with the suggestion that if enough number of television lessons could not be chosen on proper considerations then the frequency of television lessons should be reduced rather than that unsuitable topics be presented on TV.

### IV. The Special Television Series

The two television series entitled "Physics in Everyday Life" and "Chemistry in the Service of Mankind" were generally appreciated. But the series provided a debating point to the teachers, for there is a difference in the two series. While the one in Physics is mostly related to topics included in the syllabus, the Chemistry series deals with topics of general interest. Teachers who felt that they did not have enough time to cover the full course tended to disfavour the extension of series involving too many general lessons. On the other hand some teachers wanted that general lessons showing the applications of scientific discoveries be telecast as they create interest among the students. As one teacher put it, "We have to usher a budding citizen in the wide world. Let him know as much as he can. It matters little if what he knows is not always related to the syllabus." But even the latter group of teachers felt that the frequency of such general lessons should not exceed one lesson per month. A large number of topics were suggested for these series, some related to the syllabus and some of general interest. It was explained that the television lessons not directly related to the syllabus had been introduced not only to stimulate interest among the students and to acquaint them with the various developments in the realm of science but that such lessons also help to keep up the continuity of television lesson especially when the week-wise syllabus offers little scope for a lesson suited for television. The number of such lessons would automatically be kept low if the criteria suggested for selecting lessons for television are followed.

### V. Extension of Television Programme

As mentioned earlier the teachers welcomed the idea of starting Television General Science lessons for the 8th class. At present hardly any experiments are demonstrated to the 8th class students and the science lessons are given like any other text book lessons. Secondly, very few periods are devoted for this subject, the scope of which is big enough including many things besides merely Physics and Chemistry. Quite often it happens that the teachers in charge of this subject are not well qualified to teach it. In sum total it is found that very little serious attention is paid to the subject. The teachers were of the opinion that the television lessons for the 8th class would prove very useful if they were chosen carefully and if they were prepared considering the actual standard of the 8th class. They suggested that very simple lessons (simple in content as also in language) dealing with elementary physics and chemistry should be taken up. So keen were the teachers about television lessons for the 8th class that many of them wanted that they should be extended to even the 7th class. But it was explained that it may not be possible on account of lack of facilities at the Television Center. However the teachers were guarded while giving their approval for extending the Television Programme to the 11th class. As one teacher put it, "The television lessons for the 11th class should be really very good." It was not difficult to appreciate the wariness of the teachers in this respect because a great deal of importance is attached to the 11th class. The school record is judged on the basis of its results in the higher secondary examinations. The teachers see to it that the whole syllabus is covered by December at the latest so that the students get enough time to remove their individual difficulties. The teachers made the following suggestions :

1. The frequency should be one television lesson per week.
2. The topics should be carefully selected.
3. The syllabus left to be covered in the 11th class should not be too heavy as it is at present.
4. The whole course should be finished by the end of November.
5. If at all there have to be television lessons afterwards, they should be revision lessons.

There was great divergence of opinion concerning the medium of instruction for the 11th class television lessons. Some wanted it to be entirely English while others wanted that difficult concept could be explained with the help of Hindi.

### VI. Various Aspects of the TV Lessons

Apart from the abovementioned considerations the teachers came forward with suggestions regarding the other aspects of the TV lessons. They wanted that the presentation of the television lessons should be improved. They made the following points :

1. When experiments are shown, the sequence of actions and reactions should be clearly brought out in order to show that the results follow naturally and not by way of any manipulation.

2. The visual aids should be made more convincing. Diagrams, preferably animated, should be shown in place of photographs. Diagrams should be carefully screened before being shown. Mistakes should not be allowed to remain.

3. Too short a film shot should be avoided as the students usually fail to grasp the exact point being illustrated. Or a better method should be devised to use them appropriately.

4. Too much subject matter in one lesson should be avoided as that only leads to fast pace as a result of which the students do not understand much of the lesson.

5. There should be better synchronization of speech and visual material.

6. The techniques in performing experiments should be improved. The students are told to take certain precautions and to follow certain instructions while performing experiments, especially in chemistry. But when they see a television teacher disregarding the same precautions and instructions, they begin either to doubt their necessity or to under-rate the television teacher.

In this connection, the teachers suggested that somebody should watch the TV lessons while they are being recorded. It was explained to them that such a procedure was being followed. However, the President of the Post-Graduate Government Teachers' Club, Mr. Binayak Singh of the Government Boys Higher Secondary School, II Shift, Alipore Road, Delhi, promised to provide teachers for such a screening job at rehearsal time, if so desired by the TV Center.

Some teachers also suggested that films on certain selected experiments under ideal conditions could be specially prepared and then these films could be used again and again.

Another point brought up by the teachers related to the assignments for students at the end of the television lessons. Many considered the assignments to be very difficult and at times quite impracticable. They pointed out that when such assignments were given (*e.g.* locating a printing press where electrotyping work is done and then watching the process) and when they (the teachers) were unable to carry out the assignments the students felt that their teachers were no good. The assignments should be within the competence of the students. If no better assignment could be found out then some objective type questions should be given.

The question of medium for television lessons was again brought up. Some teachers wanted to revise their earlier stand on this point. After a year's experiment they felt that it would be better to have English for television lessons for the 10th. This would eventually prepare the students for the final examination which most of them take in English. In any case, they said, the difficult Hindi technical terms should not be used. It would perhaps be useful again to circulate a questionnaire on the subject of medium for the 10th and 11th, on the pattern of the previous questionnaire.

## VII. General Organization of the TV Programme

The teachers pointed out a number of difficulties they were experiencing concerning the television lessons.

(*a*) The first related to the duration of the television period in the school time-table. The duration of the television period has been fixed at 40 minutes but even now all the schools have not fallen in line. Secondly, a large number of teachers felt that the 5-minute preparation time is inadequate because in many schools students have to be taken to the place where television sets are kept. Sometimes it also happens that the television period does not begin exactly on time or that the earlier teacher takes a little longer time. Two suggestions were put forth for revising the time-distribution in the TV period:

| *Time for* | *I Suggestion* | *II Suggestion* |
|---|---|---|
| (*i*) Preparation | 10 minutes | 8 minutes |
| (*ii*) TV lesson | 20 minutes | 18 minutes |
| (*iii*) Follow-up | 10 minutes | 14 minutes |

The teachers felt that with the revised time distribution they would not have to miss the opening part of the television lessons, as happened many times in the past.

(*b*) Many teachers pointed out that the last working day of the month is meant for administrative work and that as a result in a majority of the schools the television lessons are not shown on these days. While one suggestion was to the effect that no television lesson be telecast on the last working day of the month, another was that a general television lesson not connected with syllabus be telecast and that students be asked to see it even if the teachers had to do their administrative work.

(*c*) As these meetings were held at a time when the terminal examinations were going on, a large number of teachers came forward with the suggestion that television lessons should stop at least 3-4 days before the examinations begin so as to allow enough time for the students to get ready for the ordeal. The teachers were of the view that no new topic be taken up in the last two television lessons. It so happened this time that while the TV lessons continued until the 6th December, the terminal examinations had already begun on the 3rd December, in some zones. Simultaneously it was also agreed that the terminal examinations at present take an unduly long time. Moreover, they do not begin at the same time in different zones. Some rationalization in this respect was considered necessary.

(*d*) At present no television lessons are telecast on restricted holidays. But some of these holidays *e.g.* Valmiki Jayanti are such which are observed by not more than 5% of the schools. An effort was made to ascertain the names of all such holidays. However, the teachers were unable to furnish the information. A proposal had been put forth that popular science lessons could be telecast on restricted holidays observed by very few schools, but in the absence of adequate information no clear-cut opinion emerged from the discussions.

(*e*) The question of the frequency of Television lessons is very much related to the number of total periods per week allotted to the subject teachers in the schools. No uniform practice is followed in this respect. In some schools 10 periods per week (6 for theory and 4 for practicals) are given for the science subjects. But in many schools only 4 periods per week are given for theory. When such is the case the class-room teachers tend to grudge two TV lesson period per week. Their complaint is that then they have to take extra classes to cover the syllabus. Thus it seems necessary to have an agreed minimum number of periods for Physics and Chemistry.

(*f*) The teachers complained that more often than not the guidance notes reached them late and in inadequate numbers. As a result they found themselves ill-equipped to handle either the preparation or the follow-up.

(*g*) In the school TV syllabus certain days have been kept aside for monthly tests during the academic year. However, it was pointed out by many teachers that monthly tests were held on days other than those specified in the TV syllabus booklet resulting in a double loss. The matter needs to be discussed with the school Principals.

(*h*) A couple of teachers have suggested that a few revision lessons should be telecast for the 10th class students. These lessons should be special lessons covering separate units of topics and may be telecast at a time which may be found convenient by both the shift schools, so that students from both the schools can view the lessons simultaneously. Such lessons might be viewed by students who feel the need for them. This would be an extra programme.

(*i*) It was pointed out by some teachers that they had to miss some TV lessons because of local holidays, power failures, their own absence etc. and that at times they lagged behind the prescribed week-wise syllabus. They suggested that a couple of days should be kept aside towards the end of every month so that they could get an opportunity to be on par with the TV syllabus. No TV lessons be telecast on these two days nor should any specific topic be allotted for class-room teachers. It should be left to the discretion of the latter to utilise the days according to their own needs.

While this is a good suggestion intended to introduce an element of flexibility in the week-wise TV-cum-classroom syllabus, it may turn out that the need for such an arrangement may not arise if the various criteria recommended for the planning of syllabus and selection of TV lessons are carefully followed.

### ENGLISH TEACHERS' MEETINGS

Thirteen 6th class English teachers' meetings were held at different centres throughout Delhi from 2-11-1963 to 26-11-1963. About 130 teachers from 91 schools took part in the discussions. The teachers, as a whole, were very enthusiastic about the TV lessons. In some of the meetings the discussion was quite lively. The teachers highlighted a number of problems which they had to face and they eagerly desired that their difficulties should be removed so that they could derive the full benefit from this new medium of teaching.

The following points were mentioned by a large number of teachers :—

(*a*) Students found it difficult to follow the TV teachers. The conversations between the TV teachers were usually lost on them. Consequently, they did not gain much from the TV lessons.

(*b*) Different TV teachers pronounced certain words differently.

(*c*) The pace was at times much too fast for the students. This was so especially in the beginning and when three or four sentences were spoken together in one context. But despite these difficulties the students greatly enjoyed watching the TV lessons. They always eagerly looked forward to the TV lessons.

(*d*) The presentation of structures over TV should be such (according to a few teachers) as to enable the average class-room teachers to present them in more or less the similar manner. For this the limitations of average teachers should be kept in mind.

(*e*) Enough number of guidance notes are not supplied to the schools. The teachers have to share the guidance notes making the follow-up work difficult.

(*f*) The puppets did not bring out the teaching points clearly, though the students enjoyed watching them.

Some of the teachers had a few suggestions to make :

(*a*) The TV lessons should not begin from the very beginning of the first term.

(*b*) More nursery rhymes should be taken.

(*c*) The TV teachers should be introduced a couple of times so that the students can know who is who.

(*d*) A model examination paper (based on structural approach) for the 6th class should be sent alongwith the guidance notes for the benefit of the teachers.

(*e*) Work-books for students should be prepared on the basis on the TV lessons. They can be priced publications.

A few general remarks may not be out of place here. While it is true that in some of the meetings the discussions were lively and quite frank, a good many teachers had very little to contribute to the general discussions. A large number of meetings were arranged as it was considered necessary to meet the teachers in small enough groups where all the participants could get an opportunity to present their viewpoints. Small groups are eminently suited for a fruitful comparison of experiences and a free flow of ideas. But quite often these were missing. Chance remarks, overheard conversation among the teachers as also purposeful efforts to probe the matter further, brought to surface the following factors which were responsible for the non-participation of the silent members of these groups :

(*a*) Late notice of the meetings.

(*b*) Inadequate information about the purpose of these meetings.

(*c*) No proper selection of teachers to represent the school.

These things can be kept in mind while arranging meetings in future. The programme of the series of meetings should be planned very much in advance of the actual meetings and the information should reach the teachers so as to allow them sufficient time to prepare their own notes for the meetings. It would be of great help to both the teachers and the conveners if a working paper written on the basis of (*a*) evaluation check sheets ; (*b*) visits to schools ; (*c*) teachers' observations ; and (*d*) TV teachers' point of view, is circulated alongwith the notice of the meetings. This paper should be such as to give a direction for the discussions in the meetings. The quality of the discussions would no doubt depend on the thought and preparation which goes in the planning of the meetings. It should be impressed on the school principals (as it is left to them to nominate teachers to represent their schools) that those teachers should be nominated, who have given some thought to the different aspects of the TV lessons. The nominated teachers should not only present their own viewpoints but should represent their other colleagues and the school authorities. The meetings can certainly serve teachers who wish to get clarifications for themselves but such teachers may be sent alongwith their more experienced colleagues. It was found that some of the teachers present in the meetings had not observed more than half a dozen TV lessons.

In the end it may be mentioned that many teachers expressed satisfaction that such meetings are arranged and that they were happy to meet the TV teachers personally. They also extended invitations to the TV teachers to visit their schools so that the students could get to know them.

# APPENDIX VII

## PERIODIC EVALUATION TESTS

### *A Note on an Experiment to Judge the Effectiveness of a Tele-lesson and the Follow-up.*

In order to judge the effectiveness of the tele-lesson and the follow-up, an experiment was conducted in the Govt. Boys' Hr. Sec. School, II Shift, Malviya Nagar, on the 27th November, 1962. No prior information was given to either the school authorities or the students.

Immediately after the Chemistry tele-lesson for IX class was over, the students were asked to write its summary in about 25 minutes. Then the class-teacher was requested to give his usual follow-up. Then for a second time, the students were asked to write a summary based on both the tele-lesson and the follow-up.

Thirty-seven pairs of answers were marked on a five-point scale by Mr. B.K. Ishrish, who had given the particular tele-lesson.

The analysis of the post-telecast and post-follow-up scores confirms the utility of the follow-up. In absolute figures the students scored as follows :

| | *No. of Students Scoring :* | | | | |
|---|---|---|---|---|---|
| | *A* (*Very good*) | *B* (*Fairly good*) | *C* (*Satis-factory*) | *D* (*Poor*) | *E* (*Very poor*) |
| (*i*) Post-Tele-cast | — | 5 | 9 | 29 | 3 |
| (*ii*) Postr-Follow-up | 5 | 8 | 13 | 10 | 1 |

Thus we see that while 23 students failed to give satisfactory answers immediately after the tele-lesson was over, 12 of them could improve their scores after they had had the benefit of a follow-up which could only be called just ordinary.

That 23 out of 37 students could not give satisfactory answers in the first instance, on the other hand, shows that this particular tele-lesson had failed to have the desired effect on this group of students—a group, which seemed to be an average one with its share of good and not-so-good students.

The relative differences in the scores of the individual students bring out very interesting comparisons. Briefly they can be summarised as follows:

| | *Score for First Answer* | *Score for Second Answer* | *No. of Students* | *Comment* |
|---|---|---|---|---|
| | (1) Students who show a positive difference of one point : | | | |
| (*i*) | E | D | 2 | The change does not improve their position. |
| (*ii*) | D | C | 10 | The change just tilts the balance in their favour. |
| (*iii*) | C | B | 5 | A welcome change. |
| (*iv*) | B | A | 4 | |
| | (2) Students who show a positive difference of two points : | | | |
| (*i*) | D | B | 2 | Follow-up proves most effective. |
| (*ii*) | C | A | 1 | |
| | (3) Students who show no change at all : | | | |
| (*i*) | E | E | 1 | Obviously a hopeless case. |
| (*ii*) | D | D | 8 | No change proves fatal. |
| (*iii*) | C | C | 3 | No change but no cause for worry. |
| (*iv*) | B | B | 1 | |

A point which may be mentioned here is that the teacher had given no introduction to the tele-lesson.

Though this experiment is an isolated case and does not form a part of pre-planned series of experiments, it brings out interesting information, and points to the factors which should be considered when further experiments are tried out.

Another test on a Chemistry TV lesson for class IX was given in the Ramjas Hr. Sec. School, No. 5, Karol Bagh, on the 8th January 1963, immediately after the lesson was over. No follow-up was conducted. The students were not informed before hand about the test. It was understood that the school had divided the students of its higher secondary classes into three groups according to their performance in the previous examinations. The following classification was obtained in class IX :

| | |
|---|---|
| *Group 1*<br>(One section) | Intelligent students. |
| *Group 2*<br>(Two sections) | A little above average students. |
| *Group 3*<br>(One section) | Ordinary students who if at all would just manage to get through the examinations. |

By giving a test we wanted to know how a TV lesson is received by students of different intelligence. In our discussions with a number of teachers, it was often suggested that students of ordinary intelligence are not able to follow the TV lessons. (It may be mentioned here that the evaluation check sheets sent by the teachers do not furnish any ground for such a supposition.) Though it is only to be expected that intelligent students would do better than those of ordinary intelligence, we wanted to know the standard of the lesson vis-a-vis the Group 3. The lesson selected was considered to be on the whole representative of the generality of TV lessons. We might have administered a standard intelligence test to determine their level of intelligence. But in the absence of such a test applicable to students in Delhi, we depended on a rough and ready classification as in the Ramjas Hr. Sec. School No. 5. It should also be pointed out here that this school is, on the basis of its results in the higher secondary examinations, considered to be a very good school.

Mr. B.K. Ishrish, who had given the particular TV lesson (sulphur, its purification, allotropic forms, uses and effect of heat on it) graded the answers on a five-point scale :

A—Very good ; B—Good ;
C—Satisfactory ; D—Poor ;
and E—Very poor.

The following result was obtained :—

*Table No. 1 showing the group-wise number of students getting different grades in the TV test No. 2.*

| *Grade* Or *Group* | *Students getting A* | | *Students getting B* | | *Students getting C* | | *Students getting D* | | *Students getting E* | | *Total No. of students* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *No.* | % | *No.* | % | *No.* | % | *No.* | % | *No.* | % | *No.* | % |
| Group 1 | ... | ... | 13 | 30 | 26 | 59 | 5 | 11 | ... | ... | 44 | 100 |
| Group 2 | ... | ... | 9 | 10 | 65 | 75 | 13 | 15 | ... | ... | 87 | 100 |
| Group 3 | ... | ... | 7 | 17 | 21 | 51 | 11 | 27 | 2 | 5 | 41 | 100 |
| Class as a whole | ... | ... | 29 | 16·8 | 112 | 65·2 | 29 | 16·8 | 2 | 1·2 | 172 | 100 |

This table can also be reduced to the following :

| | *Percentage of Students getting C or B Grades* | *Percentage of Students getting D or E Grades* | *Total* |
|---|---|---|---|
| Group 1 | 89 | 11 | 100 |
| Group 2 | 85 | 15 | 100 |
| Group 3 | 63 | 32 | 100 |
| Whole class | 82 | 18 | 100 |

We find that the performance of Group 3 is very much different from that of the other two groups and the class as a whole. Before we comment further on these results a couple of points need to be noted. If we study the Table No. 1, we find that the result in this particular case is more or less in consonance with the classification of the students. We see that the highest percentage of the B graders (in the absence of anybody getting A) is in Group 1 and on the other hand the percentage of students getting D grade increases from Group 1 to Group 3. But we also find that a larger percentage of students were able to get B grade in Group 3 than in Group 2 and that the percentage of students getting C grade in Group 3 is more or less comparable to that in Group 1 considering the difference between these two Groups.

This very Table is presented below in another light.

*Table No. 2, showing breakdown of students into different groups on the basis of their grades in TV test No. 2.*

| | *Group 1* | | *Group 2* | | *Group 3* | | *Total* | |
|---|---|---|---|---|---|---|---|---|
| | *No.* | % | *No.* | % | *No.* | % | *No.* | % |
| Students getting B | 13 | 45 | 9 | 31 | 7 | 24 | 29 | 100 |
| Students getting C | 26 | 23 | 65 | 58 | 21 | 19 | 112 | 100 |
| Students getting D | 5 | 17 | 13 | 45 | 11 | 38 | 29 | 100 |
| Students getting E | ... | ... | ... | ... | 2 | 100 | 2 | 100 |

This Table reinforces the trend found in the reduced version of the Table No. 1. But considering that this version does not bring out the variations shown in Table No. 1, it is better to contrast the Table No. 2 with Table No. 1. Then we find that the patterns of performance of Group 1 in both the Tables are similar with one another. But the same is not true of the Groups 2 and 3. The tendency of the Group 2 is towards grade C but its contribution to the category of D graders is more than that of the Group 3. On the other hand, as already noted down, the Group 3 had comparatively more B graders than Group 2. This may mean that

> The performance of some of the students in both the groups in this particular test was different than that in the previous exams.
>
> *Or*
>
> Probably the selection of some of the students for Group 2 and Group 3 was not on very firm or clear-cut considerations.

If the latter is true then the results might have been different had the classification been on the basis of clear-cut consideration. And it is very likely that the result then would have supported the contention of those teachers who maintain that the TV lessons are above the standard of ordinary students. A point which was mentioned earlier also needs to be stressed here once again. This test was given in a school which is acknowledged to be one of the best schools in the city. That means that the results are not representative of the generality of the TV schools. The school was selected because a system of classification of students is followed there. These results point to the necessity of conducting such tests after the level of intelligence of the students is determined after administering standard intelligence tests, and in schools of differing standards.

So long we looked at the results group-wise and grade-wise. We may now consider the performance of the groups in the context of the class as a whole.

*Table No. 3 showing the performance of the groups in the context of the class as a whole.*

| | *Students getting A* | | *Students getting B* | | *Students getting C* | | *Students getting D* | | *Students getting E* | | *Total No. of students* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *No.* | % | *No.* | % | *No.* | % | *No.* | % | *No.* | % | *No.* | % |
| Group 1 | ... | ... | 13 | 7·6 | 26 | 15·2 | 5 | 2·8 | ... | ... | 44 | 25·0 |
| Group 2 | ... | ... | 9 | 5·2 | 65 | 37·8 | 13 | 7·6 | ... | ... | 87 | 50·0 |
| Group 3 | ... | ... | 7 | 4·0 | 21 | 12·2 | 11 | 6·4 | 2 | 1·2 | 41 | 23·0 |
| Whole class | ... | ... | 29 | 16 8 | 112 | 65·2 | 29 | 16 8 | 2 | 1·2 | 172 | 100 |

We find that according to the classification of the students the class is composed of:

| | |
|---|---|
| Group 1 | Comprising 25·6% Intelligent students. |
| Group 2 | Comprising 50·6% A little above average students. |
| Group 3 | Comprising 23·8% Ordinary students. |

The performance of the class as a whole in this test was as follows

| *Grade* | *Percentage of Students Securing that Grade* | |
|---|---|---|
| A | ... | |
| B | 16·8% | |
| C | 65·2% | 82% |
| D | 16·8% | |
| E | 1·2% | 18% |

Taking into consideration the previous discussion it can be said that though on the whole the performance of the class is tolerable, the acknowledged good students have not done so very well as might be expected. The students in Group 3 have at times done better than their next higher Group.

# APPENDIX VIII

## TV STUDIOS

The present studio was earlier a large office. The size of the studio, located on the fifth floor of an annex building of All India Radio, is forty feet by twenty feet. The ceiling is low. It is equipped with two image orthicon cameras, and one vidicon camera (unmanned) for captions.

*Lights* : There are two flourescent banks, scoops, few spots and a number of car head lamps for studio lights as spot lights.

*Microphones* : Three lavolier microphones and one boom microphone.

Camera control unit is placed in one corner of the Studio floor, because of shortage of space. Telecine (film and slide) unit has been placed in a separate room. There are facilities for repairing and editing films. Two video tape recorders are placed in another air-conditioned room. A small control room is attached to the studio.

*Studio Auditorium* : The size of the studio is sixty feet by forty feet. Though fully equipped it has acoustic problems. The stage floor acts as a sound board. There are plans to remedy this problem by rebuilding the studio floor. The stage was extended to have more space for camera movement. A ramp extends from the stage centre down the main aisle, to allow cover shots. This studio is essentially for evening programmes.

# APPENDIX IX

## SCHOOL TELEVISION (Frequency)

*1961-62*

Duration of each programme : 20 minutes

Transmission to schools began in October, 1961 for Class IX.

Physics : Thrice a week.

Chemistry : Thrice a week.

Hindi : Once a week.

English : Once a week.

*From July, 1962*

Class IX : Physics : Twice a week.

Chemistry : Twice a week.

Hindi : Once a week.

English : Once a week.

Class X : Physics, Chemistry, Hindi and English : once a week each.

*1963-64*

Class IX : Physics and Chemistry : Twice a week.

Class X : Physics and Chemistry : Twice a week.

Class VI : English : Twice a week.

For High School Classes : Current Affairs : Once a week.

For Teachers :

For teachers of English : Once a month.

For teachers of Science : Once in two months.

*1964-65*

As in the previous year, with an addition of one lesson per week for class VII in English.

*1965-66*

| | *Middle Classes* | | | *Higher Sec. Classes* | | | *Total* |
|---|---|---|---|---|---|---|---|
| | VI | VII | VIII | IX | X | XI | |
| General Science | | | | | | | 2 |
| Social Studies | | | 1 | | | | 1 |
| English | 2 | 1 | 1 | | | | 4 |
| Physics | 2 | 1 | | 2 | 2 | 1 | 5 |
| Chemistry | | | | 1 | 2 | 1 | 4 |

*1966-67*

| | *For Middle Classes* | | | *Higher Sec. Classes* | | | *Total* |
|---|---|---|---|---|---|---|---|
| | VI | VII | VIII | IX | X | XI | |
| General Science | 1 | 1 | 1 | | | | 3 |
| English | 1 | 1 | 1 | | | | 3 |
| Physics | | | | 1 | 2 | 1 | 4 |
| Chemistry | | | | 1 | 1 | 1 | 3 |

*N.B.* : It would be seen that a lesson in Social Studies is dropped ; and the frequency of English lessons for class VI has also been reduced from two to one per week.

This was to co-ordinate School Broadcasts (Sound) with TV lessons. The capacity of the schools to provide listening to School Broadcasts (Sound) and TV lessons is limited ; and so also the capacity of TV Center to put out quality programmes. So, this is being tried out as an experiment.

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